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Price : Rs 20.

MAURITIUS

Annual Report

OF THE

Ministry of Agriculture

AND

Natural Resources and the Environment

for the year 1976

COMMONWEALTH MYCOLOGICAL INSTITUTE
12 SEP 1980

No. 20 of 1978

PRINTED AND PUBLISHED BY
L. CARL ACHILLE, GOVERNMENT PRINTER,
PORT LOUIS, MAURITIUS
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Agricultural Services, Ministry of Agriculture and Natural Resources and the Environment, Reduit

1st August, 1977

Sir,

I have the honour to submit the Annual Report of the Agricultural Services for the year 1976.

I have the honour to be,
Sir,
Your obedient Servant,

B. D. ROY,
Chief Agricultural Officer.

The Honourable the Minister of Agriculture
and Natural Resources and the Environment,
Ministry of Agriculture and Natural Resources
and the Environment,
Port Louis.

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Annual Report of the Ministry of Agriculture and Natural Resources (Agricultural Services) for the year 1976

I. INTRODUCTION

1.1. In virtue of an order made by the Minister of Agriculture and Natural Resources on the 31st January, 1972, the Permanent Secretary becomes the Chief Adviser to the Minister and the Chief Administrative Officer to the Ministry.

1.2. The Chief Agricultural Officer advises the Permanent Secretary on all matters referred to him — policy, administrative and technical. He is responsible for the planning, co-ordination and execution of the work of the different divisions of the technical services of the Ministry which, except for the Forestry Service, are grouped in the Agricultural Services. He is assisted by three Principal Agricultural Officers. PrincipalAgricultural Officer (Crops), Mr K. Lutchmeenaraidoo, was responsible for the coordination and implementation of the approved programme of work of the following divisions: Agricultural Division, Crop Experiment Stations, Plant Pathology, Entomology, General Chemistry; Principal Agricultural Officer (Livestock), Mr R. Brunet, was responsible for the co-ordination and implementation of the programme of work of the Animal Production Division, Livestock Breeding Stations, Animal Health Division, Dairy Chemistry Division, Rodrigues Division and Principal Agricultural Officer (Development), Mr T. M. Narain, was responsible for the co-ordination and implementation of the programme of work of the Extension Services Divisitn, Land use Division, Projects Division, Environment, Engineering Division and Field Services Division.

1.3. The Chief Agricultural Officer and the Principal Agricultural Officers also serve on a number of Boards and Committees either as Chairman or as members. These Boards and Committees are listed at Chapter II. They fall under the responsibility of the Ministry of Agriculture and Natural Resources and the Environment. They submit their own Annual Reports. This report deals with the work carried out by the professional, scientific and technical officers of the Agricultural Services.

1.4. The Board of Agriculture and Natural Resources continued to function as an advisory body to the Minister on specific matters for which sub-committees have been appointed. Measures are being envisaged to enlarge its scope.

1.5. The Ministry participated in the activities of the Comite de Collaboration Agricole. Scientists from Réunion Island visited various sections of the Agricultural Services. The Divisional Scientific Officer (Entomology), Mr J. Monty, visited Réunion Island to look into entomological problems and in particular, work carried out on the biological control of fruit flies. A common programme of work is being set up. The Divisional Scientific Officer (Entomology) also studied the enforcement of phytosanitary regulations as regards harmonisation with ours, since both countries are signatories of the Yaounde Convention.

1.6. Except for one Sugar Estate, the use of the core sampler for sampling of planter's and millers' cane for apportionment of sugar is now generalised. The cane Planters and Millers Arbritration and Control Board Act, 1973 was amended by Act No. 26 of 1976 and made effective as from May 1976, the main objective of the amendment being to raise the planters' share of sugar from 71% to 74% of the sugar in his canes.

1.7. Research on rice has been progressing satisfactorily, conducted mainly at Belle Vue Farm by the Chinese Agricultural Team and at FUEL with the assistance of the Sugar Estate. It is found possible to raise three crops of rice in a year under flooded conditions with average yields of 3, 2.5 and 3.5 tons respectively for the three crops—a total of 9 tons of air dry paddy per acre—given the right soil and temperature conditions and adequate irrigation water. Experiments continue in the screening of suitabe varieties for each season At such a level of production, rice seems capable of yielding an economic return at least comparable to that of sugar cane. But it takes a few years to create the proper soil conditions in newly developed paddies. Moreover our farm workers seem very reluctant to work in the mud of our paddy fields, necessary at transplanting, weeding and harvesting. One solution resides in the mechanisation of these operations. This aspect is being looked into, starting with small machines capable of working in small plots. Growing rice with overhead irrigation is an alternative to paddies as it will also take much of the unpleasantness of wading in the mud and is receiving our attention.

1.8. Mr N. K. Ganesh joined the Entomology Division late last year as Sericulture Expert under Indian Technical Assistance for a peroid of one year, initially to continue the work by his predecessor, the late Mr Ramamurthy. A special section has been created within the Entomology Division with Scientific Officer Mr Joomaye as counterpart to Mr Ganesh to go fully into the possibilities of rearing silkworms on mulberries for the production of raw silk and its conversion to silk fabrics as a cottage industry or even larger industrial units as this enterprise builds up in strength.

1.9. To encourage its expansion, the Minister launched a pilot scheme towards the middle of the year, guaranteeing to any farmer wishing to produce cocoons a purchase price of Rs. 20 per kilo of cocoon, free supply of mulberry cuttings for establishing mulberry plantations, silkworm larvae reared to the third larval stage and rearing equipment on loan. About 40 farmers have started rearing. Many others have shown an interest in the scheme. Yields of 600 kgs cocoons per acre per year are easily achieved in areas where the rainfall is adequate for mulberry. There are no contagious diseases of silkworms in the country. Sericulture is very labour intensive and requires a high degree of self-discipline not usually needed for other farming practices. In view of rising labour costs, it is therefore considered reasonable to envisage sericulture as a cottage industry, at least in the initial stages.

1.10. Dr Preston continued to act as consultant to the Ministry on Animal Production. The main objective remained the use of sugarcane and its by-products as sources of animal feed. A plane load of 270 heifers, a gift of the FAO/UNDP agency under the Milk and Meat Project, was received on the 7th April 1976. Two feedlots are being built, one at Richelieu Livestock Breeding Station and the second at Palmar Livestock Breeding Station, each capable of assommodating 160 cows and 160 calves. Eash feedlot will be complete with milking parlour, trench silos for ensiling chipped sugarcane and sugarcane tops, maternity pens, bull pens, mechanical effluent disposal systems, molasses tanks, cane chippers as well as a central milk treatment and packing plant at Richelieu capable of handling milk from both feedlots.

1.11. Green fodder collected by the roadside is still the most important source of feed for the small cowkeeper. This supply is getting scarce every year through the widespread use of weedicides, hence research in livestock places much emphasis on the use of sugarcane by-products as cattle feed. The small cowkeeper is being given every assistance to keep him in business, otherwise the problem of milk and meat can become very serious indeed. With the cooperation of St. Antoine Sugar Estate, a cheap molasse/bagasse feed is being prepared and sold to cowkeepers as a concentrate feed at a subsidised price. Another 6,000 cowkeepers are purchasing conventional cowfeed concentrate under another subsidy scheme. This scheme will eventually extend to the 20,000 cowkeepers who will be buying one kilo of feed per day at a subsidised price. There will be 30 sales centres throughout the country. At the end of the year, some 20 centres were operating.

1.12. Mr S. R. Upadhaya joined us in November 1976 as adviser to the Extension Services. His services have been lent to us by the Indian Government, initially for a period of one year. He has a long and distinguished carreer in agricultural research and agricultural extension: as a research officer, for ten years, at the Central Rice Research Institute, and in extension for more than twenty years occupying many responsible positions; inter-alia Principal of the Agricultural and Extension Training Centre for Extension Officers in India, Deputy Director and Director of Agricultural Extension in State Governments and Joint Director of the Extension Service of the Ministry of Agriculture in the Central Government of India. His appointment is most timely coinciding with the recruitment of many extension officers fresh from the University. The Extension Service is now better staffed and better organised. It is hoped that a certain number of vacancies that still exist can be filled with diplomates and graduates from the University some time towards the third quarter of the year 1977.

1.13. An OCAM mission visited us in the first fortnight of February. It was made up of Professor G. Pelliazo, Consultant to UNIDO, the team leader and Mr L. Bodria, also Consultant to UNIDO and was accompanied by Mr S. O. Daix, Chief of the Economic and Social Development Service of OCAM. Their visits included the Agricultural Services, in particular our Agricultural Engineering Division, the Mauritius Sugar Industry Research Institute, the Sugar Planters Mechanical Pool and workshops on a Sugar Estate. An improvement in agricultural production will require a greater degree of mechanisation, especially in connection with agricultural diversification, e.g. mechanical cultivation and harvesting of rice, mechanical plucking of tea, food processing and so on. The Engineering Division is being expanded to cope with research problems in these fields. Two additional agricultural engineers were recruited during the year. Initially modifications and improvements to machines already on the market can be envisaged.

1.14. Mr Leon Peres, Reader in Political Science at the University of Melbourne, Parkville, Victoria, Australia, visited the country in May as UNESCO Consultant for science policy. He had discussions with senior officials of the Ministry, the Mauritius Sugar Industry Reaserch Institute, the University of Mauritius, the Bureau of Standards and other organisations involved in agricultural and scientific research. The view has been expressed in different quarters that there is need for setting up appropriate machinery for the framing of a Science and Technology Policy, the planning of science and technology activities and the coordination of agricultural and scientific research in the context of the economic development of Mauritius. There is no doubt that such a body can assist in maximising financial and manpower resources.

1.15. An Agricultural Show was organized on the initiative of the Chamber of Agriculture and jointly with the Ministry of Agriculture and Natural Resources and The Environment from 1st to 11th July. The Show was officially opened on 1st July by Sir Veerasamy Ringadoo in the unavoidable absence of the Prime Minister who was taken up at Plaisance Airport with the arrival of the OUA Heads of State. The Show thus coincided with the meeting in Mauritius of the OUA Heads of State. In the words of the Minister of Agriculture and Natural Resources and The Environment, the main object of the Show was to make every citizen of the country conscious of our food problem by highlighting the efforts being made to increase significantly the local production of foodstuffs. The Chamber of Agriculture wished to make it an occasion to inform the public of the efforts being made by the private sector, and by the sugar industry in particular, in attaining the objectives set by the National Food Production Committee, which had been appointed by Government in 1974 to consider ways and means of increasing food production.

1.16. The Agricultural Show was a great success: about 200,000 people including the Governor-General, the Prime Minister and some OUA Heads of State visited the Show. There were about fifty five stands in all. The stands that attracted most people were those of FUEL and the Ministry of Fisheries. The Sericulture, Dairy, Crop Experiment Station and Animal Production stands of the Ministry of Agriculture were also popular.

1.17. The Show was held in the magnificent grounds of the Royal Botanic Gardens and thanks to the cooperation of the participants and the discipline of the general public, the Gardens were in no way damaged. The Development Works Corporation put up in record time a large car park in a marshy and so far unutilised part of the Gardens where since years, it is intended to build a special show ground complete with cafetaria for the holding of agricultural and other shows so that the Gardens can remain essentially botanical. Plans are well advanced and work may be started in the coming year.

1.18. Early in 1971, a committee was appointed by the Minister of Agriculture to investigate fully the possibility of establishing a scheme for insuring crops other than sugarcane. The committee comprised representatives of all the agricultural sectors of the country, viz. Ministry of Agriculture, Ministry of Economic Planning, Mauritius Sugar Industry Research Institute, Cyclone and Drought Insurance Board, Agricultural Marketing Board, Chamber of Agriculture, Mauritius Sugar Producers Association, Mauritius Sugarcane Growers Association, Sugarcane Planters Association, Tea Project Planters, Tea Private Planters, Tea Smallholding Planters, and Cooperative Societies.

1.19. The Committee examined first an insurance scheme for the tea crop. After several meetings it concluded that there was no need for an insurance cover for the tea crop but that the situatuion may be reviewed when the prices of tea improve. The reasons for rejecting the scheme were:—

(i) Tea bushes are resistant to cyclones;

(ii) Tea recovers easily from cyclones as the loss is about 8% and recovery is after two weeks;

(iii) The tea crop is still small; therefore premium income will be insufficient to justify a self-supporting Tea Insurance Fund.

1.20. The Committee went on to examine proposals for insurance schemes for groundnut, potato, maize, onion and ginger in Mauritius and Rodrigues, and its conclusions were as follows.

1.21. Groundnut: It was agreed that an insurance cover was not necessary as this crop was rather cyclone tolerant and that by judicious choice of planting time, the deficit in yield due to drought may be minimised.

1.22. Potato: The members were of opinion that an insurance scheme for potatoes was not essential but might be reviewed at a more convenient time. The reasons for this conclusion were that:—

(i) Cyclone was not a problem as the crop was grown in the non-cyclonic season;

(ii) Blight and wilt were the two most important problems and they could be overcome by sound fungicidal application practices and choice of resistant varieties respectively.

1.23. Maize: The point was made that the maize crop could be planted during the cyclone free season, that is August/September and March/April so as to reduce to a minimum the loss occurring through cyclone damage. The few planters who will take a calculated risk or through ignorance will grow short cycle hybrids during the cyclonic period will have at stake some Rs 300,000 However losses due to drought can be substantial. The availability of land at the required time for full stand and interline cultivation in the humid and super-humid zones, may not match the estimated requirement of some 55,000 arpents and maize will have to be grown in subhumid zones also.

1.24. It was therefore suggested that the expansion of production of this crop be closely followed for one or two years when the desirability of insuring against drought would be reconsidered.

1.25. Special consideration was given to the maize crop in Rodrigues. It was unanimously agreed that the Rodriguan farmer will not be able to contribute financially to any insurance scheme and that therefore some sort pf price support scheme should be devised. Maize was the staple food of the Rodriguan population and it was the unanimous feeling that if this commodity was offered at a price substantially lower than rice, the Rodriguan would be consuming maize in preference to rice. It was suggested consequently that the purchase price of maize at Rodrigues be Rs 1,500 per ton whiwh could be sold back to the population in the form of maize meal at Rs 800 per ton or less.

1.26. Onion: The Committee agreed that onion is being planted during the period March to June, there was no justification for an insurance scheme for this crop.

1.27. Ginger: The conclusion was that since the crop was planted during the period September to November, it does not suffer much from cyclone. In addition there was a guaranteed price for it and therefore there was no necessity for an insurance scheme for the time being.

1.28. The Committee finalized its findings on the insurance schemes for the various crops towards the middle of 1973 and from then onwards proceeded to examine possible insurance schemes for livestock. It concluded its work in the third quarter of 1976 recommending that an insurance scheme for livestock was not necessary in view of the low level of losses caused by disease or natural calamities and the premium payable for such an insurance.

II. Boards And Committees

The Permanent Secretary or his representative served on the following Boards and Committees:—

Agricultural Marketing Board
Board of Agriculture, Fisheries and Natural Resources
Board of Examiners for the Registration of Agricultural Chemists
Cane Release Committee
Institute of Education
Irrigation Committee
Land Settlement Committee
Livestock Insurance Committee
Mauritius Sugar Industry Research Institute Executive Board
Mauritius Sugar Industry Research Institute Research Advisory Board
Sugar Industry Development Fund Committee
Sugar Millers Development Fund Committee
Sugar Planters Development Fund Committee
Sugar Planters Mechanical Pool Corporation Board
Tea Board
Tea Development Authority
Tobacco Board
University of Mauritius, Senate
University of Mauritius, Council

III. Board of Agriculture and Natural Resources

3.1. The Board functions under Ordinance No. 29 of 1957. Steps are, however, being taken to revise the law governing the Board.

3.2 The following Advisory Committees were set up for specific purposes:—

(a) The Land Settlement Committee
(b) The Cane Release Committee
(c) The Irrigation Committee.

3.3. The Board met in February to make recommendations for the composition of the Cane Release Committee and the Land Settlement Committee and to approve the recommendations of the Cane Release Committee made at its meeting of December last.

3.4. The Land Settlement Committee met once. Its main business was the selection of suitable tenants for cases of transfer of holdings in the Land Settlement Scheme. The question of rentals was also considered and new rentals were recommended.

3.5. The Cane Release Committee met on one occasion during the year. The performance of eleven varieties planted in M5 nurseries was reviewed. The Committee also proposed that varieties M. 555/60, M. 574/62 and Triton be recommended to the Board of Agriculture and Natural Resources for release.

3.6. The Irrigation Committee met regularly each month. It was concerned with the allocation of water for irrigation purposes from the Magenta Canal, Pierrefonds pipeline, La Ferme reservoir and la Nicolière reservoir. The Committee was also concerned with the regulation of water flow from Tamarin Power Station to the Magenta Canal, repair work on the Nicolière Canal and the Papayes feeder canal. The quantity of irrigation water allocated to water users depended upon the supply situation in the reservoirs.

IV. Comité de Collaboration Agricole Maurice—Reunion—Madagascar

4.1. The twenty-fourth Conference of the Committee was held in Mauritius from the 2nd to 19th November 1976. Five delegates from Reunion and six from Mauritius attended the Conference. Some scientific papers were presented and visits to Experimental Stations and Sugar Estates were organised. The Committee also reviewed the programme of activities for the year 1976 and established the programme of activities for the year 1977.

4.2. Two missions from Mauritius visited Reunion Island under the auspices of the Comite de Collaboration Agricole.

V. The Sugar Industry

CROP RESULTS

5.1. Except for the western district, climatic conditions were quite favourable for the active growth of sugar cane in the vegetative period. However, weather conditions during the maturation cycle of the sugar crop was not favourable in 1976 as rainfall were generally above normal causing a drop in the sugar content, although the total sugar output amounted to 689,932 tons, the third best crop of Mauritius.

5.2. Hereunder are some of the crop results compared with those of 1975.

	1976	*1975*
Area cultivated (arpents) (total) ...	206,488	204,677
Area reaped (arpents (total) ...	191,617	189,945
(Estates) ...	105,750	104,788
Cane produced (metric tons) ...	6,402,277	4,316,115
Sugar produced, metric tons 98.5fPol.	691,473	469,207
Commercial sugar 98.7 Pol.	689,932	468,256
Tons of cane per arpent (metric) ...	33.4	22.7
Tons of sugar per arpent (metric) a 98.7 Pol.	3.60	2.46
Yield of sugar per cent cane	10.78	10.85
Crushing rate, hourly, metric tons ...	111.2	103.7
Grushing rate, daily metric tons	2,119	1,740

CANE VARIETIES

5.3. In order of importance, the main varieties making up the 1976 crop were the following on estate land: S 17, M 13/56, M 377/56 and M 93/48. These varieties accounted for 83.8 per cent of the crop. The remaining 16.2 per cent were made up of 351/57, M 31/45, M 124/59, M 438/59 M 202/46, M 442/51 and a few other varieties each grown to the extent of less than one per cent.

QUOTAS AND PRICES

5.4. The negociated price during the period 1st July to 30th June 1976 under the Common Market Agreement for a quota of 507,000 long tons was at the price of £188.57 per long ton.

EXPORTS

5.5. The exports of sugar were as follows:—

Destination	*Long Tons*	
	1976	*1975*
United Kingdom	493,671	388,184
Canada	14,408	26,553
U.S.A.	36,679	23,100
Italy	5,000	—
Seychelles	1,347	1,865
Afghanistan	—	21
Rwanda	—	591
Botswana	—	8
Yemen	9	—

Apart from the sugar exported, there were 36,358 long tons consumed locally.

MOLASSES AND ALCOHOL

5.5.1. The production of molasses for the crop amounted to 195,714 metric tons and the quantity exported during the calendar year was 176,818 metric tons. As in the previous years, molassess were used for the manufacture of rum and various alcoholic products; 327 tons of molasses were used for the preparation of cheap cowfeed at St. Antoine at the request of the Ministry of Agriculture. Medine Sugar Estate produced some 6,000 litres of vinegar and 908,000 litres of alcohol, Solitude produced 1,161,570 litres of alcohol and 28,429 litres of perfumes at 100° G.L. and St. Antoine 964,388 litres of alcohol.

VI. The Cane Planters and Millers Arbitration and Control Board

HEAD OF DIVISION: A. A. AUMEERALLY, *General Manager*

6.1. The Board operated under " The Cane Planters and Millers Arbitration and Control Board Act (No. 46) of 1973 ". The executive machinery of the Board was run as a division of the Ministry of Agriculture and Natural Resources and the Environment.

MEETING OF THE BOARD

6.2 The Board held 15 meetings during the year as follows:

3 meetings in connection with the assessment of sugar to planters;

6 meetings in connection with protests against assessment (other questions were also discussed);

1 meeting in connection of redelimitation of factory areas;

Meetings were also held regarding change of factory areas, cost of loading, transport rate, special export duty on sugar, bagasse and scums, core sampling equipment and spare parts.

CANE TESTING

6.3. The canes supplied by 579 planters or group of planters were tested separately. The total number of tests carried out was 207,557 out of which 204,518 have been obtained by use of core sampling equipment. Apart from Savannah Sugar Estate, all the other factories were equipped with mobile or fixed core sampling.

ASSESSMENT OF SUGAR

6.4. As soon as the final assessment of sugar was published for the 1975 crop, 10 cooperative credit societies and 2 groups of planters lodged protests against the awards made by the Board. The protests were heard and the Board maintained its previous assessment whilst one planter, withdrew his application.

TRANSPORT COST

6.5. The final assessment of Road Rates for the 1975 crop was issued in June, 1976. The approved rates were as follows:—

(i) Millers were entitled to claim Rs 3.22 for the first ton mile and 0.49 cs for each additional ton mile in respect of canes transported from outlying weighbridges to factories. The maximum mileage claimable was 4 miles.

(ii) Planters who had themselves caused their canes to be delivered to factories were entitled to a refund of 0.49 cs per ton mile for each mile over and above a distance of 4 miles.

DELIMITATION OF FACTORY AREAS

6.6.1. The new delimitation of the factory areas of Rose Belle, Bel Ombre, St. Felix, Union St. Aubin and Britannia were approved by the Board and published in the Government Gazette. The delimitation of other factories are being reviewed.

6.6.2. Four applications for change of factory areas were received by the Board. The first application from Medine and Reunion was withdrawn whilst the Board maintained the statuquo in the other cases.

PERMITS TO MIDDLEMEN

6.7. 5 new applications were rejected. Twenty-two permits were renewed and two new ones approved whilst the permits of two middlemen were cancelled on the ground that they had not given satisfaction to their planters in the past. The amount of the Bond has in 1976 been increased in order to give enough security to the planters. The amount of the security has been fixed by the Board at Rs 50 per ton cane, subject to a maximum of Rs 300,000.

CANE CONTRACTS

6.8.1. There were 9,460 cane contracts registered by the Board, covering some 35,700 planters.

6.8.2. The number of planters who failed to enter into contract before the 31st May 'totalled 807 compared with 770 in 1975.

CANE VARIETIES

6.9. During 1976 the varieties approved for planting were the same as for the previous crop, namely:—

B 37161	M 253/48
B 37172	M 409/51
B 51129	M 442/51
E 1/37	M 356/53
E 50/47	M 13/53
M 134/32	M 13/56
M 134/32 striped	M 377/56
M 134/32 White	M 351/57
M 31/45	M 124/59
M 93/48	M 438/59
M 202/46	N Co 376
M 99/48	S 17

CONTROL OF WEIGHBRIDGES

6.10. The number of weighbridges in operation was 76. All the weighbridges were tested for accuracy prior to the beginning of the crop. Ten were found to be incorrect on first examination, one on second examination and had to be re-tested. All weighbridges were again tested for accuracy on 4 occasions during the crop. All weighbridges, except 2 with the approval of the Board, where more than 5000 tons have been delivered during 1975, are automatic with visual indicators, recording and printing devices.

SURPRISE CHECKS CARRIED OUT AT WEIGHBRIDGES DURING THE CROP

6.11. During the crop, 2,994 suprise checks were carried out and 2,956 vehicles were reweighed (2,623 lorries and 333 carts).

APPORTIONMENT OF SUGAR AND ITS BY-PRODUCTS

.12. Section 31 of the Cane Planters and Millers Arbritration and Control Board Act, 1973 has been amended by Act No. 26 of 1976 on the 29th July, came into operation on the 1st May, 1976 and reads as follows:—

(a) by deleting subsection (i) and replacing it by the following subsection:—

Every planter shall be entitled to receive for his canes 74% of the quantity of sugar which his canes, if delivered at the factory over the crop year may normally be expected to yield according to:

(i) the average efficiency of all factories; or

(ii) the efficiency of the factory where the canes have been milled, whichever is the higher;

(b) in subsection (2) by deleting in paragraph *(b)* the words " seventy-one per cent " and replacing them by the words " seventy-four per cent "

(c) by deleting subsection (5).

VII. Agricultural Division

Head of Division: Dr A. L. Owadally, Divisional Scientific Officer (Agronomy)

Scientific Officer: Li Kwan Pun

RICE (ORYZA SATIVA)

7.1.1. Rice experiments carried out in the preceeding year at Queen Victoria, Flacq were repeated for two planting seasons of 1976.

FIRST SEASON — JANUARY TO JUNE

7.1.2. In the variety trial to compare the yield of six rice varieties, none was found to outyield the control variety IR532-208 which yielded 6.25 metric tons Hectare.

7.1.3. Three fertiliser trials A, B and C were carried out using variety IR532-208.

7.1.4. In trial A, the application of potassim was basal, that of phosphorus was non limiting and nitrogen was applied at the following levels: N_0= 0 kg N/ha, N_1=50 kg N/ha, N_2=100 kg N/ha, N_3=150 kg N/ha, N_4=200 kg N/ha. There was no significant difference in yield of paddy between the treatments and the control. The treatment N_4 (200 kg N/ha) gave 6.27 metric tons/ha which was the highest yield and treatment N_3 (150 kg N/ha) gave 5.87 metric tons/ha which was the lowest yield.

7.1.5. In trial B, the application of potassium was non-limiting, that of phosphorus was basal and nitrogen was applied at the same levels as in A. No significant difference in yield among the treatments was noted. Treatments N_4 (200 kg N/ha) and N_3 (150 kg N/ha) gave 5.71 metric tons/ha and 4.42 metric tons/ha of paddy respectively being the highest and the lowest yields.

7.1.6. In trial C, both potassium and phosphorus were applied in non limiting amounts and nitrogen was applied at the same levels as in trial A. No significant difference in yield was obtained between the treatments.

SECOND SEASON — JULY TO DECEMBER

7.1.7. In the variety trial, the variety IR665–6291 outyielded the other varieties though difference in yield figures was not significant. Varieties IR665–6292 and IR532–9334 yielded 11.11 and 10.63 metric tons/hectare respectively compared to a yield of 11.67 metric tons/hectare for IR665–6291. The variety 63–83 gave the lowest yield 9.07 metric tons/hectare.

7.1.8. In fertiliser trials A, B and C, no significant difference in yield was obtained. The highest paddy yields obtained were 8.97 metric tons/ha, 7.52 metric tons/ha and 5.55 metric tons/ha for trials A, B and C respectively.

Scientific Officer: C. G. Pallany

TOBACCO (NICOTIANA TABACUM L.)

VARIETY TRIALS

7.2.1. Assessment and comparison of varieties N.C. 95, S.C. 66, S.C. 71, S.C. 72, Coker 347, Speight G 28 and Speight G 33 which started in the second tobacco season of 1975 was continued for both seasons of 1976 at Richelieu Experiment Station. A new variety SCR introduced in 1975 was included in the trials. In the first season, results showed significant differences in yields of fresh and cured leaves of the different varieties. The highest yield of green leaf was achieved with Coker 347 (21, 129 kg/ha). At the 5% level, significant differnnces existed between the yield of Coker 347 and that of the others with the exception of SCR. The yields of the two lowest yielding varieties were (14, 149 kg/ha) for Yellow Mammoth and (16,400 kg/ha) for S.C. 71 respectively.

7.2.2. Coker 347 was also the highest yielder of cured leaf with an average yield of 2,284 kg/ha. At the 1% level, varieties Coker 347, SCR, Speight G 33 and S.C. 72 were found to outyield the Control Variety Yellow Mammoth.

7.2.3. S.C. 72 gave the largest number of curable leaves per plant (26.4). S.C. 72 together with SCR were the tallest plants (135.5 cm). In the first case, the difference in the number of leaves of S.C. 72 and the rest was highly significant ($P = 0.01$), whereas in the latter case, the heights of plants from S.C. 72 differ significantly only from plants of the variety Speight G 28 (110.2 cm).

7.2.4. Results obtained in the first season indicated that S.C. 72 and S.C. 66 were relatively late flowering varieties, the first one taking 67 days and the second 66 days to reach the 50% flowering stage. The control variety Yellow Mammoth, the earliest flowering variety took 59 days only. Statistical analysis showed significant differences in the flowering hehaviour between either S.C. 66 and Yellow Mammoth.

7.2.5. In an assessment carried out in that same experiment varieties N.C. 95, S.C. 66, Sp. G 28, Coker 347 a,nd S.C. 72 showed fair resistance to nematode infestation. Varieties Speight G 33 and S.C. 71 were as susceptible as Yellow Mammoth whereas the newly introduced variety SCR showed a high degree of susceptibility.

7.2.6. In the second season, however, N.C. 95 gave the highest yield of fresh leaf (15, 131 kg/ha); but no significant difference ($P = 0.05$) existed between that yield and that of Speight G 28, S.C. 71, Coker 347, SCR and S.C. 72. All the varieties outyielded Yellow Mammoth.

7.2.7. Speight G 28 was the best performer in terms of yield of cured leaf (2, 758 kg/ha). At the 5% level, all varieties significantly outyielded the control variety Yellow Mammoth. Statistical analysis further shows no significant difference (P = 0.05) between speight G 28, N.C. 95, SCR and S.C. 71 on the one hand and between speight G 33, S.C. 66, S.C. 72, Coker 347 and S.C. 71 and on the other hand. At the 1% level, however, the yield of Yellow Mammoth (1,104 kg/ha) did not differ significantly from that of variety speight G 33 (1, 798 kg)

7.2.8. Once again, S.C. 72 gave the largest number of curable leaves (20.23) and the tallest plants (102.05 cm). In the first instance, the number of leaves from plants of S.C. 72, Coker 347 and Speight G 28 did not differ significanty (P = 0.05). Likewise the heights of plants from S.C. 72, S.C. 71 and Coker did not differ.

PLANTING DATE EXPERIMENT

7.2.9 The experiment to determine the optimum date for planting of a tobacco crop was repeated for both seasons of 1976 at Richelieu Experiment Station. Each experiment was of a randomized block design with the following five treatment:

	First Season		*Second Season*
P_1=	Transplanting	Mid—February	—Beginning August
P_2=	,,	Beginning—March	—Mid August
P_3=	,,	Mid—March	—Beginning—September
P_4=	,,	Beginning—April	—Mid—September
P_5=	,,	Mid—April	—Beginning—October

The treatments were replicated four times. Sowing and hence transplanting were spaced at fifteen days intervals. P_2 proved to be best treatment in both seasons, achieving yields of 18,961 kg of fresh leaf and 2,641 of cured leaf per hectare, in the first season and 14,605 kg of fresh leaf and 2,135.8 kg. of cured leaf in the second season. In the first season P_2 did not differ significantly (P = 0.05) from those of P_4 and P_3. Also differences between P_2 and P_1 in the second sesson were not significant...

7.2.10. Although during the first season, the tallest plants were obtained with P_4 (118.7 vm), there was no significant difference between the five treatments. During the second season, however, P_2 gave significantly taller plants (P = 0.01) than the other treatments.

7.2.11 The largest number of curable leaves per plant were obtained within treatment P_1 in the first season (21.5) and within P_2 in the second season (17.9). In both season, differences between treatments were not significant.

N—FERTILIZER TRIAL

7.2.12. This experiment was to determine the optimum level of Nitrogen (N) to maximise gross returns of the commercially grown variety N.C. 95. It was carried out in both seasons of 1976 at Richelieu Experiment Station. The treatments arranged in a latin square design were : N_0 = 0 kg N/ha; N_1 = 15 kg N/ha; N_2 = 30 kg N/ha; N_3 = 45 kg N/ha; N_4 = 60 kg N/ha. In the first season treatment N_4 with a yield of 18,039 kg. of fresh leaf and 2,320 kg. of cured leaf was the best treatment. The four treatments under trial differ significantly at the 1% level from the control N_0. In the second season, however, N_1 yielded the highest amount of fresh leaf (15,742.8 kg/ha) while N_2 the highest amount of cured leaf (2,582 kg/ha). In bothc ases, treatments did not differ significantly.

CHEMICAL CONTROL OF SUCKERS EXPERIMENT

7.2.13. This experiment was conducted in the second season of 1976 with six treatments and four replicates arranged in a randomized block design. The treatments were:

T_1= Control—Hand suckering
T_2= Royal MH (Systemic chemical)
T_3= MH 30 (Systemic chemical)
T_4= Royaltac (Contact) + MH 30 (Systemic)
T_5= Off-shoot (Contact) + Royal MH (Systemic)
T_6= Off-shoot T–85 (Contact)

Best results in terms of yield of green and cured leaf were obtained with treatment T_5 i.e. application of off-shoot T–85 followed one week later by Royal MH. The yields achieved were 16,412 kg of fresh leaf per hectare and 2,622 kg of cured leaf per hectare. No significant difference was obtained between the treatment values.

SEED PRODUCTION

7.2.14. Selection was carried out in tobacco plantations at Richelieu Experiment Station on the basis of *(a)* plant height, *(b)* number of leaves per plant *(c)* resistance of plants to diseases. The number of plants that were selected, selfed and bagged was as follows:

N.C. 95	= 500
S.C. 66	= 225
Yellow Mammoth	= 100
Amarello	= 240

Scientific Officer: J. M. Heerasing

GARLIC *(Allium sativum L.)*

FERTILIZER TRIAL

7.3.1. A trial was planted in a randomized block design with five replicates, at Plaisance Experiment Station, to determine the optimum level of nitrogen application to maximize the yield of bulbs of garlic var. Rodrigues. The treatments were 4 levels of nitrogen viz:

(i) 25 kg N/ha (N_1)
(ii) 50 kg N/ha (N_2)
(iii) 75 kg N/ha (N_3)
(iv) 100 kg N/ha (N_4)

The results are shown in table I.

TABLE I

YIELD AND QUALITY OF GARLIC

Treatment	*Mean Yield (kg/ha bed)*	*Bulb Quality (%Grade B)**
25 kg N/ha (N_1)	5238.2	40.5
50 kg N/ha (N_2)	5962.0	58.2
75 kg N/ha (N_3)	5857.0	56.7
100 kg N/ha (N_4)	6238.4	61.5
S.E. of a mean ±	238.0	4.3
L.S.D. (5%) ±	733	13.3

*Bulb diameter 2.5 to 5.0 cm.

The results indicate that in terms of total yield, the only significant difference occured between the two extremes of nitrogen application, namely N_1 (25 kg N/ha) and N_4 (100 kg N/ha). The quantity of the bulds, as measured, on a weight basis, by the % of grade B bulds (diameter 2.5 to 5.0 cm) appears to be linearly related to the amount of nitrogen applied. It is found to increase at the rate of 0.123% per kg extra nitrogen. No grade A bulbs (diameter 5 cm) were harvested.

OBSERVATIONAL TRIAL ON TOP SETS

7.3.2. A trial was set up at Barkly Experiment Station, to investigate the possibility of producing marketable garlic bulbs from top sets. A poor yield, equivalent to 1.8 t/ha of bed space, was harvested, of which more than 95% of the bulbs were less than 2.5 cm in diameter.

OPTIMUM TIME OF PLANTING TRIAL

7.3.3. A trial was conducted in a randomized block design with five replicates, at Central Experiment Station, to determine the optimum time of planting of garlic var. Feng Shan Selection No. 1. The planting dates chosen were the 5th and 19th May and the 3rd and 17th June. The results are shown in table II.

TABLE II

YIELD AND QUALITY OF GARLIC

Treatment	*Mean Yield (kg/ha bed)*	*Bulb Quality (% Grade B)**
5th May	5104.2	45.2
19th May	4062.6	23.8
3rd June	2729.2	13.7
17th June	3178.8	Nil
S.E. of a mean ± ...	726.7	3.8
L.S.D. (5%) ± ...	2239.3	11.68

The results indicate a significant drop in yield from May to June. A linear relationship seems to exist between the time of planting and actual yield and the loss is estimated at about 335.5 kg/ha bed per week lateness. However, the loss in yield due to late planting in May does not appear to be different from the loss in June. The quanlity of the bulbs, as measured, on a weight basis, by the % of grade B bulbs (diamater 2.5 to 5.0 cm), suffered a significant deterioration from the first planting date onwards. No grade A bulbs (diameter 5 cm) were harvested.

SPACING TRIAL

7.3.4. A trial was conducted in a randomized block design with 5 replicates at Plaisance Experiment Station, to determine the optimum inter-row spacing in garlic cultivation. The spacing adopted were:

(i) 7.5×7.5 cm (S_1)
(ii) 7.5×15.0 cm (S_2)
(iii) 7.5×22.5 cm (S_3)
and (iv) 7.5×30.0 cm (S_4)

The result are shown in table III.

*Bulb diameter 2.5 to 5.0 cm

TABLE III

YIELD AND QUALITY OF GARLIC

Treatment	*Mean Yield (kg/ha bed)*	*Bulb Quality (% Grade B)**	*Confidence Interval for Bulb Quality (5%)*
7.5× 7.5 cm (S_1) ...	6305	3.16	(0.471 , 8.11)
7.5×15.0 cm (S_2) ...	7029	31.30	(21.6 , 41.81)
7.5×22.5 cm (S_3) ...	7352	72.07	(62.9 , 82.2)
7.5×30.0 cm (S_4) ...	5467	77.30	(67.5 , 85. 8)
S.E. of a mean ± ...	176.2		
L.S.D. (5%) ± ...	548.2		

The results show a highly significant difference in yield among the treatments, and the total yield appears to be at a maximum at an interrow spacing of about 20 cm. The F-test indicates a highly significant difference in quanlity as measured, on a weight basis, by the % of grade B bulbs (diameter 2.5 to 5.0 cm), among the treatments. At high densities, halving the plant population brings about an increase in quality i.e. in the % grade B bulbs of theorder of 30% on a weight basis. Hoever, at low densities, it appears that there is a levelling of the quality of the produce. No grade A bulbs (diameter 5 cm) were harvested.

VARIETY TRIAL

7.3.5. A trial was conducted in a randomized block design with five replicates, at Central Experiment Station, to assess the yield potential and buld quality of four varieties of garlic. The varieties were:

(i) Feng Shan Selection No. 1,
(ii) Feng Shan Selection No.2,
(iii) Pooning,
(iv) Rodrigues.

The result are shown in table IV.

TABLE IV

YIELD AND QUALITY OF GARLIC

Variety	*Mean Yield (kg/ha bed)*	*Bulb Quality (% Grade B)**
Feng Shan Selection 1 ...	4000	41.6
Feng Shan Selection 2 ...	3938	35.9
Pooning	2802	32.8
Rodrigues	4771	52.6
S.E. of a mean ± ...	290.6	7.18
L.S.D. (5%) ± ...	895.4	22.12

The table IV shows that the variety Rodrigues gave the best yield and quality of bulbs. The total yield varied significantly among the varieties but no significant difference in quality, as measured, on a weight basis, by the % of grade B bulbs (diameter 2.5 to 5.0 cm) were observed among them. No grade A bulbs (diameter 5 cm) were harvested.

*Bulb diameter 2.5 to 5.0 cm

ONION *(Allium cepa L.)*

FERTILIZER TRIAL

7.4.1. The factorial fertilizer trial on onion March setts, var. Local Red, conducted in March 1975, was repeated at Palmar Experiment Station.

The treatments were:

(1) 3 levels of K_2O, in the form of the muriate salt viz.
- (i) 0 kg K_2O/ha,
- (ii) 40 kg K_2O/ha, and
- (iii) 80 kg K_2O/ha,

(2) 4 levels of N, in the form of ammonium sulphate viz.
- (i) 0 kg N/ha,
- (ii) 30 kg N/ha,
- (iii) 60 kg N/ha, and
- (iv) 90 kg N/ha.

The results were similar to those of 1975 in that no significant difference was observed in the yield of bulbs among the treatments.

INTRODUCTION OF NEW ONION VARIETIES FROM NIGERIA

7.4.2. Seeds of 12 onion var. were received from the International Institute of Tropical Agriculture, (IITA) Ibadan, Nigeria, towards the end of 1975. Half of the varieties were tested at Barkly Experiment Station and the other half at Plaisance Experiment Station. It was observed that all the varieties failed to initiate bulb formation at either Barkly Experiment Station and Plaisance Experiment Station after six and seven months respectively.

OBSERVATIONAL TRIAL

7.4.3. A trial was conducted at Barkly, Palmar and Plaisance Experiment Stations, from February to October, to compare the yield potential of 2 newly introduced onion varieties viz. California Red and Yellow Granex, with that of the Local Red variety. The best yield and quality of onion bulbs were obtained from var. Yellow Granex, followed by Local Red and California Red.

GINGER *(Zingiber officinale Roscoe)*

7.5.1. A trial was conducted in a randomized block design with 5 replicates, at Plaisance Experiment Station, to determine the effect of planting distance on the yield of green ginger. The spacings chosen were:
- (i) 9×9 ins (S_1)
- (ii) 12×12 ins (S_2)
- (iii) 15×15 ins (S_3) and
- (iv) 18×18 ins (S_4)

The results are shown in table V.

TABLE V

MEAN YIELD OF GREEN GINGER

Spacing (ins)	*Mean Yield (kg/ha)*
9×9 (S_1)	17,100
12×12 (S_2)	13,560
15×15 (S_3)	13,410
18×18 (S_4)	8,030
L.S.D. 5% ±	5,490

The highest mean yield of green ginger was harvested from the closest spacing S_1 (9×9 ins). F test indicates that significant differences exist between spacing S_1 (9×9 ins) and S_4 (18×18 ins) and between S_2 (12×12 ins) and S_4 (18×18 ins).

PEAS *(Pisum sativum)*

VARIETY TRIAL

7.6.1. A trial was conducted in a randomized block design with 5 replicates, at Plaisance Experiment Station. to compare the green pea and green pod yields of 3 pea varieties. The performances of the varieties are shown in table VI.

TABLE VI

PERFORMANCES OF 3 PEA VARIETIES

Variety	*Crop cycle (days)*	*Mean green pod yield (kg/ha)*	*Shelling % (Weight of shelled peas/ (Weight of unshelled peas)*
Merveille de Kelvedon ...	60	260	60±5
No. 40	95	1312.5	45±5
Local	90–100	3100	60±5
L.S.D. (5%)± ...		752	

It was observed that the variety No. 40 gave significantly higher yield of green pods than Merveille de Kelvedon but significantly lower yield than the local variety.

CUCUMBER *(Cucumis sativus L.)*

7.7.1. An observational trial was in progress at Curepipe Experiment Station to compare the yield potential of 2 American varieties viz. Poinsett and Palmar with that of the local variety.

Scientific Officer: K. LAN CHOW WING

LETTUCE *(Lactuca sativa L.)*

SPACING AND N FERTILIZER TRIALS

7.8.1. Three trials were performed during the year. Two were set at Curepipe Experiment Station, one trial in winter and the other in summer, whereas the third was set at Richelieu Experiment Station in summer only. The variety used was the Local Mignonette. Each trial was laid out in a 3^2 factorial design with four replicates. Treatment were as follows.

A. Spacings : S_1=20 cm. ×20 cm.
S_2=24 cm. ×24 cm.
S_3=30 cm. ×24 cm.

B. Ntrogen levels : N_1= 0 kg. Sulphate of ammonia/hectare
N_2=300 kg. Sulphate of ammonia/hectare
N_3=600 kg. Sulphate of ammonia/hectare

(The winter trial at Curepipe Experiment Station, however, received N levels of 300, 600 and 900 kg. Sulphate of ammonia per hectare). The above N levels were applied as side dressing two weeks after transplanting the seedlings. A basal dressing of manure at 36 tons/ha. and 12: 12: 17: 2 at 450 kg/ha. was also applied.

TABLE 5

RESULTS

7.8.2. YIELD OF LETTUCE (g.)/sq.m. — Curepipe (winter season)

	N_1	N_2	N_3	*Mean*	
S_1 ...	2263^a	2308^a	2383^a	=2318	S.E.=
S_2 ...	1580_b	1641_b	1673_b	=1631	±31 3
S_3 ...	1111_d	1182_{cd}	1290_c	=1194	
Mean =	1651	1710	1782	—	

S.E.= ± 31.3

S.E. for figures in body of table = ± 54.2

Treatments with letters in common do not indicate significance at 5% level.

TABLE 6

YIELD OF LETTUCE (g.)/sq.m. — Richelieu (Summer season)

	N_1	N_2	N_3	*Mean*	
S_1 ...	2987^a	3066^a	3018^a	=3024	S.E.=
S_2 ...	2120_{bcd}	2353_b	2125_{bc}	=2199	±76.4
S_3 ...	1882_{cde}	1797_e	1825_{de}	=1835	
Mean =	2330	2405	2323	—	

S.E. = ± 76.4

S.E. for figures in body of table = ± 132.4

Treatments with letters in common do not show significance at 5% level.

7.8.3. The summer trial at Curepipe was affected by drought. However total weight of lettuce/bed and diameter of heads were taken, and an F-test done on the corrected mean weight per head did not show any significance among the treatments. In the other trials, the mean weight per head increased significantly with increase in spacings. Higher applications of nitrogen tended to increase the weight, but there was no significant difference between the treatments. The most significant effect on total yield (tables 5 and 6) was obtained from the spacing treatments; the 20×20 cm. spacing gave the highest yields.

TOMATO *(Lycopersicon esculentum Mill.)*

VARIETY TRIAL

7.9.1. The objective was to compare the yield potential of nine tomato varieties. The seedlings were transplanted on 30th April to Richelieu Experiment Station. A randomised block layout was used with four replicates. The fruits

were picked at the ripe stage, and eleven harvests were made from the end of June to the end of August. Results are summarised below:

TABLE 3

MEAN YIELD IN METRIC TONS/HECTARE AND MEAN FRUIT WEIGHT

Variety	*Yield (M. Tons/ha)**	*Mean fruit weight (g)*
1. Regina (Hybrid) ...	45.7[a]	123
2. Moneymaker (Local) ...	41.9[ab]	71
3. Anahu	39.9[abc]	131
4. Heinz 1370	35.2[abc]	106
5. Marglobe (Local) ...	33.2[bc]	132
6. Saturn	32.6[bc]	116
7. Marmande	31.4[bc]	109
8. Venus	29.5[c]	121
9. Heinz 1350	29.0[c]	113
S.S. ...	± 2.78	± 6.5

OKRA *(Abelmoschus esculentus* (L) Mœnch)

VARIETY TRIAL

7.10.1. This trial comprising of four varieties—Clemson's Spineless from Australia, Perkins' Spineless from U.S.A., one Indian Variety, and the Local Variety was started in October 1975 at Pamplemousses Experiment Station. A randomised block layout was used, with five replicates. Harvest lasted from 28th November 1975 to 5th June 1976, during which time the tender fruits were harvested three times a week.

7.10.2. The main results are tabulated below:—

TABLE 1

MEAN YIELD—METRIC TONS PER HECTARE

Variety	*Yield*
Perkins' Spineless ...	22.06
Clemson's Spineless ...	16.63
Local	15.46
Indian	10.12
S.E. ...	±1.15

L.S.D. at 1% level 4.98
L.S.D. at 0.1% level 7.04

TABLE 2

MEAN PLANT SIZE (AT FIVE MONTHS)

Variety	*Height (cm.)*	*Spread ( )cm.*
Perkins' Spineless ...	154	72 ± 10
Clemson's Spineless ...	149	73 ± 12
Local	220	136 ± 25
Indian	200	60 ± 14

*Treatments with letters in common are not significantly different at 1% level.

7.10.3. Yield of Perkins' Spineless was therefore superior over the other varieties. Its smaller plant size made harvesting easier compared to the local variety. Its yield might also be increased were a closer spacing employed, since spread was only half of that of the local variety. The local variety was also found to be a late yielder.

SPACING AND N FERTILIZER TRIAL

7.10.4. The trial, using a 3^2 factorial design with four replications, was set at Pamplemousses Experiment Station, following the variety trial. Seeds of the Variety Perkins' Spineless were sown in soil blocks and the seedlings were transplanted on the 21st of October 1976. Treatments were as follows:—

A. Spacing : S_1=80 cm. ×30cm.
S_2= 80 cm. ×40 cm.
S_3= 80 cm. ×50 cm.

B. Nitrogen levels : N_1= 63 kg N/ha.
N_2=94.5 kg N/ha.
N_3=126 kg N/ha.

7.10.5. Harvest started in late November and will proceed until March or April of the following year.

EGG—PLANT *(Solanum melongena* L.*)*

VARIETY TRIAL

7.11.1. Four imported varieties, namely Black Long, Purple Long, New York Spineless and Valencia Black Round and two local varieties, Farcie and Cipaye Narain were planted at Pamplemousses Experiment Station in October. Only variety Cipaye Narain proved to be tolerant to bacterial wilt, *Pseudomonas solanacearum.*

The following mean yields were obtained (on per hectare basis):—

Black Long	...	—0.14 tons
Purple Long	...	—1.2 tons
New York Spineless	...	—0.79 tons
Valencia Black Round		—0.75 tons
Farcie ...	...	—0.41 tons
Cipaye Narain	...	—8.5 tons

SWEET PEPPER *(Capsicum annuum* L.*)*

VARIETY TRIAL

7.12.1 Two trials were conducted, one at Central Experiment Station in summer and one at Richelieu Experiment Station in winter. Varieties compared

were Keystone Resistant Giant, California Wonder, Chinese Giant and Dunputh. Seeds of Dunputh were however, not available for the winter trial. The marketable yields obtained were as follows:

TABLE 4

MARKETABLE YIELD CALCULATED IN METRIC TONS/HECTARE

Variety	*Yield at Central E.S. (M. tons/ha)*	*Yield at Riclieu E.S. (M. tons/ha)*
1. California Wonder ...	5.92	10.54
2. Keystone Resistant Giant ...	5.45	10.68
3. Chinese Giant	3.68	6.37
4. Dunputh	3.62	—
S.E.	±1.14	± 1.17
L.S.D. at 5%	1.57	3.62

The F-tests showed that the two imported varieties yield significantly higher than the local varieties.

HOT PEPPER *(Capsicum annuum* L.*)*

OBSERVATIONAL TRIAL

7.13.1. Two imported varieties, Anaheim and Long Thin Cayenne both from U.S.A were grown together with the local variety " Cipaye ", at Plaisance Experiment Station during the winter. Anaheim bore large fruits of the "Carri" ype while Long Thin Cayenne had fruits thinner than those of the Local variety. However only the local variety was relatively tolerant to bacterial wilt, *Pseudomonas solanacearum*. Records were kept for a harvesting period of three months.

The following mean yields were obtained (m. tons/ha)

Anaheim ... ... —0.25 m. tons/ha.

Long Thin Cayenne ... —0.49 m. tons/ha.

Local Cipaye ... ... —3.77 m. tons/ha.

BEAN *(Phaseolus vulgaris* L.*)*

VARIETY TRIAL

7.14.1. The first trial was performed in May at Plaisance Experiment Station and the second one in August at Pamplemousses Experiment Station. In both trials a randomised block layout was used with four replicates. There were eight varieties, all being of the dwarf (or bush) type with green pods. Variety Roquen however was yellow-podded. Pods of the imported varieties were found to be comparatively " Stringless ".

TABLE 7

RESULTS

7.14.2 MEAN YIELD OF TENDER PODS. (Kg. Per Hectare)

Variety	*Plaisance E.S. Yield (kg./ha)*	*Pamplemousses E.S. Yield (kg./ha)*
1. Harvester (imported)) ...	8950^{ab*}	5433^{xyz*}
2. Contender (imported) ...	9231^{ab}	5890^{xy}
3. Coco Early White (imported) ...	7699^{b}	4595^{yz}
4. Roquen (importêd) ...	12301^{a}	4402^{z}
5. Long Tom (local)	8376^{ab}	5646^{xyz}
6. Local Red (local)	7066^{b}	4531^{yz}
7. Victory (local)	11346^{ab}	6148^{x}
8. Pioneer (local)	8164^{ab}	5473^{xyz}
S.E.=	±1308	±445

Among the imported and green-podded varieties, Contender was always the highest yielder. Among the local varieties, Local Red gave the lowest yield of tender pods. At both sites, there was no significant difference among the varieties, except between the highest and lowest yields.

SOYABEAN *(Glycine max)*

INTERNATIONAL SOYABEAN EVALUATION PROGRAMME (INTSOY)

7.15.1. Two variety trials (Nos. 41C and 42C) each of sixteen treatments and four replicates were laid out in a randomized block design at Pamplemousses Experiment Station. Seeds of experiment No. 41C were sown in March and those of experiment No. 42C were sown in November. Among the data collected were: grain yield, plant height, nodule count and amount of shattering and lodging.

Scientific Officer H. ROJOA

TEA—*Camellia sinensis* (L) O. Kurtze

7.16.1. This report is divided broadly into two sections; the first deals with the agronomic experiments carried out on tea plants at Wooton Experiment Station, namely fertilizer trials, pruning height, pruning time, tipping height and mulching. The second section reports on clonal selection carried out on the same station from 1971 to 1976.

AGRONOMIC EXPERIMENTS

7.16.2. Only one new out of nine experiments in progress was laid out during the year 1976. The objective of the new experiment IVA was to investigate the response of phosphorus by tea plants in the presence of mulch. The mulches used were tea waste, pruned tea leaves, cane bagasse, and sawdust. The experiment was a completely randomized design with 4 replicates. This experiment will last for 6 years, i.e. two cycles of three years.

7.16.3. Experiment I, the objective of which was to determine the optimum pruning cycle of tea, was designed in 1971. It has now completed its first cycle of 5 years. This experiment was of a randomized block design with 4 replicates. The experiment comprised of 5 treatments, each containing 200 bushes of tea separated by a guard-row.

*Treatments with letters in common do not show significance at 5% level.

The treatments are:—

Treatment		*Time of Prune*
T_1	...	Every year
T_2	...	Every 2 years
T_3	...	Every 3 years
T_4	...	Every 4 years
T_5	...	Every 5 years

7.16.4. In the programme of pruning and skiffing, the following sequence was followed for each treatment.

Treatment	*Year 0*	*Year I*	*Year II*	*Year III*	*Year IV*	*Year V*
T_1 ...	Prune	Prune	Prune	Prune	Prune	Prune
T_2 ...	Prune	Unprune	Prune	Unprune	Prune	Unprune
T_3 ...	Prune	Unprune	Deep Skiff	Prune	Unprune	Deep Skiff
T_4 ...	Prune	Unprune	Deep Skiff	Deep Skiff	Prune	Unprune
T_5 ...	Prune	Unprune	Deep Skiff	Unprune	Deep Skiff	Prune

7.16.5. Deep Skiff is a form of light pruning carried half way between the level of prune and the initial tipping height.

7.16.6. Results

Treatment	*Mean yield/plot kg of green leaf*	*Yield kg/acre (greenleaf)*
T_1	507.55	2854.96
T_2	526.20	2959.89
T_3	538.7	3030.18
T_4	526.4	2961.00
T_5	564.5	3175.75

7.16.7. The difference between the yield of the treatments did not prove to be statistically significant. The results showed an appreciable increase in yield up to the treatment T3; afterwards a decline in yield was observed at treatment T4 followed by a further increase in yield at treatment T5.

7.16.8. The objective of experiment II was to find the effect of split applications of a fixed dose of nitrogen on yield. The experiment had 5 treatments and 4 replicates. Each plot consisted of 100 bushes. The treatments were as follows:—

Treatment	*Mode of application*	*Time of application*	*Dose 1 lb of N/acre*
T_1 ...	1 application ...	Mid September ...	190
T_2 ...	2 Split applications ...	(i) Mid August ...	95
		(ii) December/January ...	95
T_3 ...	3 Split applications ...	(i) Mid August ...	70
		(ii) Mid December ...	60
		(iii) Mid March ...	60
T_4 ...	4 Split applications ...	(i) Mid August ...	50
		(ii) Mid November ...	50
		(iii) Mid January ...	50
		(iv) Mid March ...	40
T_5 ...	5 Split applications ...	(i) Mid August ...	40
		(ii) Mid October ...	40
		(iii) Mid December ...	40
		(iv) Mid February ...	40
		(v) Mid April ...	30

7.16.9. Results:—

Treatment	Yield/plot kg of greenleaf	Yield/Acre kg.
T_1	113.9	5128.9
T_2	110.9	4990.9
T_3	109.3	4918.5
T_4	115.02	5176.1
T_5	114.05	5132.25

7.16.10. The difference in yield between the treatments was not statistically significant as in the past five years, i.e. splitting the dose of N fertilizer did not affect the yield of greenleaf. Taking labour cost and time factor into consideration it would be advisable to apply the whole fertilizer in one application. But the climatic factor plays an important role in the proper utilization of nitrogen fertilizer. In regions where the annual rainfall is greater than 5,000 millimeters per annum, and is not fairly distributed over the year, it is still considered advisable to apply nitrogen fertilizer on two occasions — one in August and the second in January or February.

7.16.11. Experiment III, whose objective was to determine the optimum rate of N-appilcation in relation to yield and economic return reached its 5th year. It comprised of 5 treatments and 4 replicates in a randomized block design. Each plot contained 200 bushes. The treatments were as indicated below:—

Treatment	Dose lb N/Acre	Time of application
T_1	150	3 split applications— (i) Mid September (ii) Mid November (iii) Mid February
T_2	200	
T_3	250	
T_4	300	
T_5	350	

7.16.12. Results

Treatment	Mean yield/plot kg. greenleaf	Yield/Acre kg. of greenleaf
T_1	608.26	4561.95
T_2	623.53	4676.48
T_3	657.42	4930.65
T_4	682.16	5116.20
T_5	673.87	5054.03

L.S.D. at 5%=35.95

L.S.D. at 1%=50.367

Standard error of the difference between two means= ± 16.487

7.16.13. Analysis of variance of the results shows that the difference in yield between the treatments is significant at 1% level of probability.

7.16.14. The yield indicates an increase for every unit of fertilizer applied. At treatment T_4, i.e. 300 lb of nitrogen per acre per annum, the yield reaches a maximum, after which the yield falls for every unit of fertilizer added. The plant does not respond further to doses higher than 300 lb of nitrogen per acre/annum. The results of the past five years show the same pattern of behaviour. With the subsidy on fertilizer and the price of greenleaf, a dose of 300 lb of nitrogen per acre per annum will give an economical return to the tea planters.

7.16.15. Experiment X is similar to Experiment III but the dose of nitrogen was in the order of 80, 100, 120, and 140 lb of Nitrogen per acre per annum. It had a randomized block design with six replicates. Each plot contained 200 bushes.

7.16.16. The results indicate that the plant did not show any response to nitrogen at lower doses. But this is a preliminary interpretation of the data so far collected.

7.16.17. The objective of Experiment VII was to determine the optimum time of prune ranging from January to December. It has completed its 1st cycle of 3 years. It was of a randomized block design with 4 replicates; it had 12 treatments and each treatment contained 70 bushes.

7.16.18 RESULTS

Treatment	*Time of Prune*	*Mean yield/plot kg. of greenleaf*	*Yield/Acre kg. of greenleaf*
T_1	March	64.67	4,157.63
T_2	April	70.31	4,520.25
T_3	May	68.37	4,395.80
T_4	June	69.93	4,459.80
T_5	July	62.25	4,002.05
T_6	August	60.25	3,873.47
T_7	September	54.87	3,527.58
T_8	October	52.68	3,386.80
T_9	November	48.74	3,197.78
T_{10}	December	49.06	3,154.07
T_{11}	January	58.68	3,772.05
T_{12}	February	59.63	3,853.90

L.S.D. at 5%=5.02

L.S.D. at 1%=6.76

Standard error of the difference between two means $= \pm 2.47$

7.16.19. The difference in yield of greenleaf between the treatments was significant at 5% level. The study revealed that treatments T_7–T_{12} gave a yield inferior to the first six treatments i.e. T_1–T_6. Hence the experiment was modified; the number of treatments was reduced to 6 i.e. treatments from March to August were maintained for a closer comparative study.

7.16.20. Experiment VIII started in December 1974. Its objective was to find the optimum pruning height. The treatments were pruning heights of 24 in, 26 in, 28 in and 30 in from the ground level. Each treatment was tipped 6 inches from the pruning level. The experiment was of a randomized design block with 5 replicates. Preliminary results indicate that difference between the treatments are not significant.

7.16.21. Experiment IX was designed to investigate the optimum tipping height of tea. The treatments were 4, 5, 6 and 8 in. above the pruning height and they were replicated five-fold in a randomized block design. The trend was that treatment T1 i.e. 8 in. tipping gave a slightly higher yield that 6 in. tipping. But the difference in yield between the treatments was not significant.

CLONAL SELECTION

7.16.22. Clonal selection was carried out in field 9 in May 1976 at Wooton Experiment Station, Curepipe. The field was pruned in mid June 1976. A second selection was carried out in September 1976. Half the number of bushes from preliminary selection was discarded. During the period of flushing, a third selection was done in October 1976; only 136 bushes were selected.

CHLOROFORM TEST

7.16.23. It is a test to assess the fermentation quality of a bush. In the year 1976, 4,080 tests were carried out on selected bushes. An average of 18 chloroform tests are carried out per bush in 3 rounds. The second leaf from the growing bud of tea is chosen for this test. It is enclosed in an atmosphere of chloroform for 90 minutes. The leaf develops a characteristic colour according to its fermentation quality. The bushes are classified accordingly as good or bad fermenter.

ROOTING TRIAL

7.16.24 Rooting trial on bushes selected in previous years was started in November 1975 and ended in April 1976. The trial comprised of selected bushes from field 60B, 6A, 3 and 4. Usually 45 cuttings from each selected bush are planted in soil contained in plastic sleeves and subdivided in 3 replicates of 15 each. The result is obtained from the rooting performance of the cuttings over a period of 6 months.

MANUFACTURE

7.16.25. Manufacture is a process by which tea is evaluated for its quality i.e. taste, flavour and colour of the brew.

7.16.26. Withered tea leaf from the selected bushes are rolled in a Pizey roller for 60 minutes using specified weights. After this lapse of time, the rolled leaves are allowed to ferment for 2 hours and then dried in an oven at 182°F for one hour. The made tea samples are sent to India for evaluation. The evaluations of clones OBS 18, OBS 22 and OBS 23 were comparable to VP1H, the standard. In all 71 manufactures were carried out for the year 1976.

PERFORMANCES OF VARIOUS CLONES

7.16.27. The performances of clones OB 26/2 and OB 18/3 in field 6 OB were found to be unsatisfactory and were eliminated. Their chloroform tests were average and their evaluation for made tea was inferior to VP1H, the control. However field 6 OB was reconsidered for clonal selection in May 1975 owing to the large number of varieties present in it.

7.16.28. Clone F6/97 and Clone F6/283 in Field 6A had good fermentation quality. Their percentage survival in rooting trial was between 50 to 60%. Their selection will depend upon their evaluation of made tea.

7.16.29. Clone F3/15, F3/58, F3/66, F3/172 and F3/356 were considered from Field 3. They were all rejected with the exception of F3/66 owing to the poor quality of tea made. Clone F3/66 had good fermentation quality compared to other clones. It will undergo two additional rounds of manufacture for final assessment.

7.16.30. In field 4, 17 clones have been selected for investigation. Of these, the following 6 clones F4/6, F4/77, F4/103, F4/106, F4/273 and F4/278 were found to have good rooting capacity and good fermentation quality. An evaluation of their quality of made tea has yet to be determined.

7.16.31. A rooting trial on 4,350 cuttings from clones in Field 7 and 6 OB on a preliminary basis started in December 1976.

Scientific Offfcer: S. SEERUTTUN

CITRUS *(Citrus spp.)*

7.17.1. Disease-free budwood received from Reunion Island in March, 1976 was grafted on to five different rootstocks, namely Rangpur Lime, Citrange Troyer, Sunki Tangerine, Cleopatra Mandarin and Citrus Volkameriana.

7.17.2. Seventy-two successfully grafted plants were planted in September, 1976 at Palmar, with a view to establish an isolated orchard of disease-free mother plants for future propagation.

7.17.3. A second batch of budwood was received from Reunion Island in November. The grafted plants will also be planted at Palmar.

7.17.4. The grafts include scion of the following varieties:—

Oranges	: Pineapple, Hamlin, Valencia Late Frost, Valencia Late Olinda.
Mandarins	: Carvahal, Dancy, Fremont, Commune.
Lemons	: Eureka.
Grapefruit	: Marsh.
Lime	: Tahiti, Bearss.
Hybrid	: Tangor Ortanique.

STRAWBERRY *(Fragaria vesca)*

7.18.1. Five varieties of strawberry, imported from Australia, are being propagated. They are: Red Gauntlet, Torrey, Cambridge Favourite, Cambridge Vigour and Tioga.

7.18.2. A mulching trial carried out this year showed that bagasse mulch gave the highest yield of marketable fruits, though there was no significant difference among the treatments.

7.18.3. The variety trial gave the following mean yields:—

Variety	*Yield kg/plot*	*Yield (bed area) M. tons/ha.*	*Average Weight per fruit (g.)*
1–4	2.203	4.080	4.0
Fresno	1.832	3.393	6.2
Local	1.794	3.322	4.0
1–8	1.161	2.150	3.3
Tioga	1.089	2.017	5.8
CR	0.835	1.546	3.6

CR=Cambridge Rearguard

7.18.4. The fruits of varieties Tioga and Fresno are big and appealing, though the plants are susceptible to drought. The "Local" variety produces fruits of average size and weight and the plants show better adaptation to local conditions.

GRAPES *(Vitis vinifera L.)*

7.19.1. Two similar trials are being conducted at Plaisance and Richelieu Experiment Stations to determine the best stock/scion compability. A trellis-training system is being used for the vines.

PAPAYA *(Carica papaya L.)*

7.20.1. Seeds obtained from Hawai were sown and 131 plants of variety Waimanalo and 47 plants of variety Sunrise Solo were planted at Richelieu Experiment Station and Reduit Experiment Station, respectively, in April 1976

7.20.2. The plants flowered three months after planting. Harvest started at Richelieu in the last week of December, and would problably start by mid-February in Reduit.

7.20.3. Waimanalo plants at Richelieu Experiment Station were found to be highly susceptible to mite attack, though the fruit was well-shaped and free from disease. Its taste was good.

7.20.4. The Solo variety bore more fruits per plant than variety Waimanalo and the fruits took a longer period to ripen. The fruits of variety Solo were rather irregular in shape and size.

ANTHURIUM *(Anthurium spp.)*

7.21.1. Plants grown in the Reduit Experiment Station were in bloom. They exhibited considerable variation in colour, shape and size of flowers. An experiment will shortly be undertaken to investigate the suitability of a few growth media.

Scientific Officer: O. BISSONAUTH

SUGARCANE *(Saccharum officinarum)*

7.22.1. The Agricultural Division started three experiments at Richelieu E.S. in 1974, in order to determine the agronomic practices for the production of sugarcane variety S17 as a potential source of animal feed for milk and meat. These three experiments are on the cutting interval of cane, its time of planting, and its spacing.

THE CUTTING INTERVAL EXPERIMENT

7.22.2. This experiment was planted on the 16th May, 1974, the aim was to investigate the effects of different cutting intervals on the total yield of the crop (stalks and tops). A randomised block design with 9 treatments and 4 replicates was used. The treatments were 9 cutting intervals ranging from 4 to 12 months after planting. By the end of May, 1976, all the treatments had been harvested at least twice. Analysis of data over the second year of growth shows that there was no significant difference in the yield of dry matter, but there were significant differences in terms of fresh matter, crude protein and crude fibre. In the case of fresh matter, the difference between treatments was highly signifi cant. The 8 month cutting interval yields more in terms of fresh matter, than any other treatments. Result over a period of 30 months showed that an 8 month cutting interval gave higher yields than the other treatments in terms of all the four components mentioned above.

7.22.3. This experiment will continue next year; unfortunately it has suffered from a severe attack of the insect *Pulvinaria iceryi* in December, 1976.

THE TIME OF PLANTING EXPERIMENT

7.22.4. This experiment was designed to investigate the effects of different planting dates at monthly intervals on the yield of sugarcane (stalks and tops). The design was a randomised block with 12 treatments and 4 replicates. The treatments were the plantations in each month of the year. The first plantation was done on the 4th October, 1974 and the last on the 4th of September, 1975. Harvests were done at 12 months from planting, and the yields of fresh matter, dry matter, crude protein, crude fibre in tons/ha/year were calculated.

7.22.5. The table below shows the yield of fresh matter in terms of summer plantations/winter plantations.

TABLE 1

YIELD IN TONS/Ha/Yr

Season	*Summer*	*Winter*
Yield (Tons/Ha/Yr) ...	86.2	48.4
S.E. of a mean ±	4.12	3.75

7.22.6. The difference between the mean yields of fresh matter of summer plantations and winter plantations was highly significant, the former yielding nearly twice as much as the latter.

SPACING AND FERTILIZER EXPERIMENT

7.22.7. The objective of this experiment was to investigate the effects of 4 plant populations at three levels of Nitrogen fertilisation on the yield of sugarcane (stalk and top). A split plot design with 3 main treatments and 4 sub-treatments and having 4 replicates was used. The main treatments were the application of 100,200 and 300 kg. Nitrogen per hectare; the sub-treatments were the plantation of 30000, 36250, 45000 and 60000 cuttings per hectare, corresponding to planting distances of 150 cm, 125 cm, 100 cm and 75 cm between rows. This experiment was planted in May 1974. Harvests were done at 12 months interval; the first one was in May 1975, and the second in May 1976. The following results were obtained.

TABLE 2

YIELD IN TONS/Ha/Yr

Main treatments	
100 kg N/Ha ...	... 116.8
200 kg N/Ha ...	... 128.6
300 kg N/Ha ...	... 126.9
Sub-treatments	
30000 cuttings/Ha	... 120.8
36250 cuttings/Ha	... 116.9
45000 cuttings/Ha	... 129.9
60000 cuttings/Ha	... 128.7

7.22.8. Statistical analysis shows that there was no significant difference in the main treatments as well as in the sub-treatments.

7.22.9. This experiment also has been severely attacked by the insect *Pulvinaria iceryi.*

FODDER GRASSES

7.23.1. The experiment is to compare the suitability of 8 grass species as a source of fodder. It was set up in January, 1974 at Curepipe Experiment Station. The design was of a randomised block with 4 replicates, each replicate having 8 plots. The grasses were harvested 8 times during 1976. The average yields per plot of the 8 grasses were as follows, harvests having been done on the dates indicated:

TABLE 3

YIELD IN KG/PLOT (Plot size = 12×12 ft) (1976)

Harvest Date	*9th Jan.*	*19th Feb.*	*15th March*	*15th Apr.*	*8th June*	*3rd Aug.*	*13th Oct.*	*14th Dec.*	*Kg/Plot/ Yr*
Pennisetum purpureum	84.5	31.7	20.25	22.25	23.75	16.25	18.25	23.0	240
Cenchrus ciliaris ...	3.25	1.5	0.4	1.06	0.44	—	—	—	
Chloris gayana ...	42.55	15.75	11.75	11.6	13.75	8.75	8.75	14.25	125
Panicum maximum ...	51.0	22.25	15.0	20.0	23.25	14.5	15.0	19.75	181
Bracharia brizantha ..	55.25	25.5	14.0	17.6	26.75	12.75	12.0	27.0	191
Bracharia ruziziensis	42.5	21.75	11.25	16.4	15.25	5.75	6.75	27.75	147
Tripsacum laxum ...	53.75	24.5	16.6	16.25	25.5	14.0	16.25	20.0	181
Setaria sphacelata ...	72.0	28.5	18.75	18.4	23.2	21.25	15.25	61.0	259

TABLE 4

YIELD IN TONS/Ha/Yr

Species	*Fresh Matter*	*Dry Matter*	*Crude Protein*	*Crude Fibre*
Pennisetum purpureum ...	179.3	34.0	3.3	10.8
Cenchrus ciliaris ...	—	—	—	—
Chloris gayana ...	94.1	22.7	2.3	7.34
Panicum maximum ...	135.2	29.1	2.9	9.4
Bracharia brizantha ...	142.7	29.6	2.9	9.0
Bracharia ruziziensis ...	109.8	25.6	2.3	8.2
Tripsacum laxum ...	135.2	25.8	2.5	8.4
Setaria sphaecelata ...	193.5	55.1	2.9	12.7
L.S.D. at 5% ± ...	59.04	9.85	1.2	3.5

Table 4 above shows the yield in Fresh matter, Dry matter, Crude Protein and Crude fibre.

7.23.2. Statistical analysis of fresh matter shows that there are highly significant differences between the mean yields of the grasses. *S. sphacelata* is the best yielder, followed by elephant grass. The winter of 1976 completely eliminated the species *Cenchrus ciliaris* in the experiment, that is about two and a half years from planting. This experiment will continue for one year more but the grasses will be harvested at the optimum stage of each one instead of all being harvested at the same time.

7.23.3. A similar experiment was replanted at Palmar during period 23rd February, 1976 to 20th March, 1976 because the previous plantation had done badly due to lack of water. By the end of 1976 five harvests were done, the average yield per plot and the corresponding date of harvest were the following:

TABLE 5

YIELD IN KG/PLOT (Plot size = 4m × 4m) (1976)

Species / *Harvest date*	*18th May*	*30th June*	*18th Aug.*	*19th Oct.*	*17th Dec.*	*Total*	*Kg/Arp.*
Pennisetum purpureum ...	60.25	53.75	19.75	9.0	49.5	192.25	50,756
Cenchrus ciliaris ...	19.75	25.5	10.75	9.0	16.4	81.40	21,490
Chloris gayana ...	30.75	23.0	17.5	6.5	14.25	92.0	24,289
Panicum maximum ...	37.25	33.25	10.0	3.0	21.75	105.25	27,787
Bracharia brinzantha ...	23.10	22.0	12.75	7.5	7.87	73.22	19,331
Bracharia ruziziensis ...	63.87	23.25	5.75	—	12.0	104.87	27,687
Digitaria decumbens ...	14.0	20.5	1.25	—	5.0	40.75	10,758
Setaria sphaecelata ...	34.75	33.75	7.75	—	37.9	114.15	30,137
Pennisetum clandestinum ...	33.75	23.0	11.75	—	5.0	73.5	19,405

7.23.4. Elephant grass *(Pennisetum purpureum)* did well in the Palmar region and it was the best. The present trend indicates an annual production of over 75 tons/arpent/year. This grass may yield in the Palmar region as much as *Setaria sphacelata* (the best species for Curepipe) can yield in the Curepipe region.

OBSERVATIONAL TRIALS ON WHITTET KIKUYU *(Pennisetum clandestinum)*

7.23.5. Observational trials were done on the grass Whittet Kikuyu at Plaisance Experiment Station, Curepipe Experiment Station and Reduit Experiment Station. At Palmar, the grass was included in the experiment mentioned in the previous paragraph. At Curepipe, growth of the Whittet Kikuyu was poor, at Plaisance it was much better. It was planted at Plaisance in june on an area of 12.5m × 17 m harvested on 14th October, 1976. The yield was 90 kg = 1.789 tons/Arpent of fresh matter.

BELLE VUE STATION

(Chinese Agricultural Team)

DEVELOPMENT

7.24. About 240 metres of farm road were improved. Some of the big rocks and most of the stones were removed from the tilth layer of the paddy fields to facilitate ploughing and to provide conditions for better crop production. Slightly more than 1 arpent (0.37 ha.) of land was cleared and planted to citrus and pawpaw trees.

PERIOD COVERING JANUARY TO JUNE 1976

7.25.1. Total area under rice plantation was 5.78 arpents (2.44 ha.) comprising 4.02 arpents (1.70 ha.) devoted to production and 1.76 arpents (0.74 ha.) to various experiments. The average paddy yield from the production unit was 3.19 tons/arpent (7.57 tons/ha.) and the highest yield per unit of 0.16 arpent (0.067 ha.) was 3.70 tons/arpent (8.77 tons/ha,). The average paddy yield obtained from experimental fields was 3.07 tons/arpent (7.26 tons/ha.). The total yield of paddy was 18.25 metric tons and were sent to the Richelieu Rice Milling Station.

RICE VARIETY TRIALS

7.25.2. Two rice variety trials were conducted. TN1 was used as control in both trials and was compared to newly introduced varieties from the People's Republic of China. Randomised complete block design with replicates was used in each trial. The plot size was 15 m^2 and the spacing between hills was 20 cm × 16.5 cm.

RESULTS

TABLE 1

PADDY YIELDS (VARIETY TRIAL 1)

Variety	*tons/arpent*	*tons/hectare*
Red Plum Zao	3.94	9.33
Chen Chu i No. 11	3.68	8.73
Kwang Loo i No. 4	3.63	8.59
Nanking No. 11	3.46	8.20
Kwang Tan i	3.43	8.13
TN1 (control	3.29	7.80

7.25.3. Red Plum Zao outyielded all the rest and difference in yield was highly significant. Varieties Chen Chu i No. 11 and Kwang Loo i No. 4 followed. The control variety TN1 gave the lowest yield.

7.25.4. In this trial, the short cycle varieties gave higher yields. It might be due to the bad climatic conditions prevailing at the flowering and maturing periods of the late maturing varieties thus adversely affecting their yields.

TABLE 2

PADDY YIELDS (VARIETY TRIAL 2)

Variety	*tons/arpent*	*tons/hectare*
Kwang Er i 5–3	4.05	9.60
TN1 (control)	3.49	8.26
Kwang Tan i	3.43	8.13
Ban Tai	3.35	7.93
Chew Chan i No. 39	3.29	7.80
Kwang Hua i No. 4	3.06	7.26

7.25.5. The variety Kwang Er i 5–3 was the top yielder followed by the control variety TN1. Difference in yield between the above two varieties reached 5% significance level. The variety Kwang Hua i No. 4 gave lower yield than the rest and reached1% significance level.

SPACING TRIAL

7.25.6. A randomised complete block spacing trial using variety TN1 with four replications was carried out.

Results of paddy yields were as follows:—

TABLE 3

PADDY YIELDS

Treatment	*Code*	*Area per hill cm²*	*Tons/arpent*	*Tons/hectare*
20 cm × 13 cm ...	C	320	3.25	7.70
20 cm × 13 cm ...	E	260	3.21	7.60
23 cm × 10 cm ...	G	230	3.14	7.45
16 cm × 16 cm ...	F	256	3.06	7.26
26 cm × 10 cm ...	D	260	3.02	7.15
26 cm × 13 cm ...	A	338	2.95	7.00
33 cm × 10 cm ...	B	330	2.93	6.95

7.25.7. The yield difference between C,E and G as well as those between F, D, A and B were insignificant. Treatment C gave significantly higher yield than either A or B at 1% level.

RESPONSE OF SINGLE SUPER PHOSPHATE

7.25.8. A randomised complete block design fertiliser trial with TN1 using four levels of single super phosphate (20% P_2O_5) and four replicates to determine the optimum level of single super phosphate to be applied was carried out. The Treatments were applied as basal dressing and the plot size was 3.5 m × 3.5 m.

RESULTS

TABLE 4

PADDY YIELDS

Treatment		*Code*	*Paddy Yield*	
Kg/arpent	*Kg/ha*		*tons/arpent*	*tons/ha.*
0. control	0 control	A	3.67	8.70
63.3	150	B	3.93	9.30
94	225	C	3.91	9.27
126	300	D	4.01	9.50

7.25.9. Treatment D gave the highest yield. There was no significant difference in yield between B, C and D. Yield difference between control A and the other treatments was highly significant.

7.25.10. Investigation, two weeks after transplanting, showed that plants from control plots had produced new roots which were weak compared to strong ones in the treated plots. Plants from the treated plots had many tillers while the control plots had very few tillers.

RESPONSE OF MURIATE OF POTASH

7.25.11. The objective of this experiment was to determine the optimum level of muriate of potash (60% K_2O). A randomised complete block design with four replicates was used. The variety TN1 was adopted and the plot size was 3.5m × 3.5m. 50% of the total amount of muriate of potash was applied as basal dressing and the remaining 50% as top dressing at panicle initiation stage.

RESULTS

TABLE 5

PADDY YIELDS

Treatment		*Code*	*Paddy Yield*	
kg./arpent	*kg./ha.*		*tons/arpent*	*tons/ha.*
0 control	0 control	A	3.80	9.01
31	75	B	3.89	9.23
63	150	C	3.89	9.23
94	225	D	3.94	9.33

7.25.12. From analysis of variance, the yield difference between treatments failed to reach significance level. Treatment D was the top yielder.

SPLIT APPLICATION OF AMMONIUM SULPHATE

7.25.13 A fertiliser trial on split application of ammonium sulphate at difference stages of growth using a randomised complete block design with four replicates was carried out with TN1. The plot size was 3.5m × 3.5m. 35% of the total amount of ammonium sulphate was appied as basal dressing and the rest as top dressings at tillering, panicle initiation and heading stages.

RESULTS

TABLE 6

PADDY YIELDS

Treatment	*Code*	*tons/arpent*	*tons/ha.*
All stages (control)	A	4.07	9.63
Except at heading stage ...	B	3.99	9.45
Except at panicle initiation stage ...	C	3.95	9.37
Except at tillering stage ...	D	4.04	9.57

7.25.14. The yield differences between treatments was insignificant. However, treatment A gave the highest yield followed by D whereas C gave the lowest yield.

ORGANIC MANURE AS BASAL DRESSING

7.25.15 A randomised complete block design with four replicates was adopted. Each treatment received an equivalent of 35 kg N per arpent (83 kg. N/ha.) as basal dressing apart from P and K fertilisers. Two top dressings were applied using inorganic fertilisers.

RESULTS

TABLE 7

PADDY YIELDS

Treatment	*Code*	*tons/arpent*	*tons/ha.*
Crotolaria juncea	A	4.12	9.76
Cow manure	B	3.88	9.19
Chicken manure	C	3.96	9.39
Ammonium sulphate	D	4.05	9.59

7.25.16 The difference in paddy yields was highly significant between A and B and significant between D and B. There was no significant difference between treatment A, C and D and also between C and B.

RICE IN VIRGIN SUGARCANE INTERROWS

7.25.17. A rice variety trial in virgin sugarcane interrows was carried out in the beginning of March. The sugarcane varieties were S17 and M13/56 and spacing was 3 ft×7 ft. The rice varieties were recently introduced from the People's Republic of China and were all of early maturing type. Rice seeds were sown in the 7 ft interrows. There were 7 rows of rice per 7 ft interrow of sugarcane at 20 cm apart. The seed rate was 57 kg./arpent (135 kg./hectare) on pure stand basis. Surface irrigation was used once every 7–8 day interval.

7.25.18. The whole growing cycle of Kwang Loo i No. 4, Red Plum Zao, Chen Chu i No. 11 and Dryland rice D183 was 105, 109, 115 and 98 days respectively. Their respective paddy yields were 0.77, 0.58, 0.56 and 0.42 tons per arpent (1.82, 1.37, 1.33 and 0.99 tons per hectare) or 1.54, 1.16, 1.11 and 0.83 tons per arpent (3.65, 2.75, 2.63 and 1.97 tons per hectare) on pure stand basis. The unsatisfactory yields were mainly due to the unfavourable climatic conditions at flowering and maturing stages and the closing up of the sugarcane leaves at the later stages. The Dryland DI83 gave the poorest yield due to severe lodging at the flowering stage.

PEST CONTROL ON RICE

7.25.19. Strawfly, rice skipper and rice stem borer were the three recurrent rice pests at Belle Vue Station. The following measures were adopted to control the pests.

A. One spray of D.D.V.P. on rice seedlings a week prior to transplanting against straw flies.

B. A mixture of D.D.V.P. and sevin (1: 2.5: :1000) applied two weeks after transplanting against rice skippers and strawflies.

C. One spray of sevin (1:400) or malathion (1:1000) applied 30 days after transplanting to control rice skippers.

D. One spray of sevin (1:400) appied 50 days after transplanting to control rice stem borers.

7.25.20. It was observed that the optimum time of spray against rice skippers is when the tips of leaf blades start to roll up. At this time the freshly hatched larvae climb up to the leaf tip to roll and damage it. Good results were obtained because the larvae are still young, less resistant and more accessible to the insecticides. Generally the young larvae will die within one day after spraying. A spray of Sevin (1:400) five to six days after oviposition (the eggs start to turn black) will reduce the rice stem borer damage. From observation, the eggs fail to hatch or the newly hatched larvae are instantaneously killed.

PERIOD COVERING JULY TO DECEMBER 1976

7.26.1. Total area under rice cultivation was 5.64 arpents (2.38 hectares). 4.15 arpents (1.75 ha.) were devoted to production and 1.49 arpents (0.63 ha.) to various experiments. The production plots gave an average of 4.15 tons paddy/arpent (9.83 tons/ha.). The highest yield obtained was 4.95 tons of paddy per arpent (11.73 tons/ha.) from a plot of 0.086 arpent (0.036 ha.) planted to variety Kwang Er i 5–3. The experimental plots gave an average of 3.17 tons of paddy per arpent (7.51 tons/ha.). All the harvested grains with the exception of those kept for planting materials were sent to the Richelieu Rice Milling Station.

RICE VARIETY TRIAL

7.26.2. Varieties in variety trial of last season were chosen for this experiment with the exception of Kwang tan i which was replaced by Kwang Er i 5–3. The same design was used as in the previous crop.

RESULTS

TABLE 8

PADDY YIELDS

Treatment	*tons/arpent*	*tons/hectare*
Kwang Er i 5–3	5.29	12.53
Chen Chu i No. 11	4.72	11.17
TN1 (control)	4.61	10.91
Nanking No. 11	4.56	10.80
Red Plum Zao	3.99	9.45
Kwang Loo i No. 4	3.38	8.01

7.26.3. The yields of both Kwang Er i 5–3 and Chen Chu i No. 11 were higher than the control variety TN1. The former variety was highly significant whereas the latter was not. Yields of the early maturing varieties Kwang Loo i No. 4 and Red Plum Zao were lower than TN1 and reached significance level. Besides their short growing cycles, Kwang Loo i No. 4 and Red Plum Zao suffered from bad climatic conditions during their effective tillering stages.

SPACING TRIAL

7.26.4. Last crop experiment on spacing trial was repeated this season

RESULTS

TABLE 9

PADDY YIELDS

Treatment	*Code*	*Area per hill cm²*	*tons/arpent*	*tons/ha.*
20 cm × 16 cm	C	320	3.63	8.61
20 cm × 13 cm	E	260	3.58	8.47
16 cm × 16 cm	F	256	3.50	8.29
26 cm × 10 cm	D	260	3.42	8.10
23 cm × 10 cm	G	230	3.41	8.07
26 cm × 13 cm	A	338	3.40	8.06
33 cm × 10 cm	B	330	3.17	7.52

7.26.5. Treatment C gave the highest paddy yield followed by E while B gave the lowest yield. The yield difference between C and A was significant and that between C and B was highly significant. There was no significant difference in yield between treatments C, F, E, D and G.

RESPONSE OF SINGLE SUPERPHOSPHATE

7.26.6. Last crop experiment on response of single superphosphate was repeated and results were as follows:—

TABLE 10

PADDY YIELDS

Treatment			*Paddy Yield*	
Kg./arpent	*Kg /ha*	*Code*	*tons/arp.*	*tons/ha*
0 control	0 control	A	3.33	7.88
63.3	150	B	3.71	8.79
94	225	C	3.84	0.09
126	300	D	3.91	9.26

7.26.7. The paddy yields of treatments B, C and D were higher than A and reached 1% significance level. There was no significant difference between B, C and D. As in the last experiment, treatment D gave the top yield followed by C.

RESPONSE OF MURIATE OF POTASH

7.26.8. The experiment to determine the response to application of muriate of potash was repeated with the same treatments as conducted in the first season.

RESULTS

TABLE 11

PADDY YIELDS

Treatment			*Paddy Yield*	
Kg./arpent	*Kg /ha*	*Code*	*tons/arp.*	*tons/ha.*
0 control	0 control	A	4.01	9.50
31	75	B	4.00	9.47
63	150	C	4.07	9.65
94	225	D	4.09	9.68

7.26.9. The results were almost the same as those conducted early this year. No significant difference was obtained between yields of the different treatments. Treatments D and B gave the highest and lowest yields respectively.

RICE VARIETY TRIAL IN 1st YEAR RATOON SUGARCANE INTERROWS

7.26.10. The objective of this new experiment was to select early maturing and high yielding rice varieties suitable for planting in ratoon sugarcane interrows.

Sugarcane variety M13/56
Date planted August, 1975.
Date harvested 11th August, 1976.
Rice varieties under test
Red Plum Zao
Kwang Loo i No. 4
Chen Chu i No. 11
Date sown 22nd August,1976.

RESULTS

TABLE 12

PADDY YIELDS

Variety	*mixed stand*		*pure stand*	
	tons/arpent	*tous/hectare*	*tons/arpent*	*tons/hectare*
Kwang Loo i No. 4 ...	1.01	2.39	2.56	6.07
Red Plum Zao ...	0.99	2.34	2.51	5.94
Chen Chu i No. 11 ...	0.75	1.78	1.91	4.51

7.26.11. Kwang Loo i No. 4 outyielded the other varieties. Chen Chu i No. 11 gave the lowest yield mainly because of late maturing and bird attacks during the later period of its growth.

7.26.12. The growth cycles from sowing to maturity were 120 days, 121 days and 133 days for Kwang Loo i No. 4, Red Plum Zao and Chen Chu i No. 11 respectively. Shorter crop cycle is conducive to higher percentage of full grains and higher 1000 grain weight being less affected by the sugarcane canopy.

7.26.13. Optimum area for rice cultivation in 1st year ratoon sugarcane interrows

Sugarcane variety M13/56

Sugarcane spacing 5 ft × 5 ft

Plot size 18 m^2

Treatments

(a) 3 rows of rice 20 cm apart per alternate sugarcane interrow.

(b) 4 rows of rice 20 cm apart per alternate sugarcane interrow.

Percentages of sugarcane land occupied by rice cultivation were 39.4 and 52.5 for a and b respectively.

7.26.14. Three rice varieties were used.

Red Plum Zao

Kwang Loo i No. 4

Chen Chu i No. 11

RESULTS

TABLE 13

PADDY YIELDS

Variety	*Treatment*	*Pure Stand*		*Mixed Stand*	
		tons/arpent	*tons/ha,*	*tons/arpent*	*tons/ha.*
Red Plum Zao ...	3 rows	2.63	6.24	1.04	2.46
	4 rows	2.62	6.20	1.37	3.25
Kwang Loo i No. 4 ...	3 rows	2.43	5.75	0.95	2.26
	4 rows	2.19	5.19	1.15	2.72
Chen Chu i i No. 11 ...	3 rows	1.55	3.67	0.61*	1.45*
	4 rows	1.59	3.76	0.83	1.97

* Yield severely affected by birds.

7.26.15. The yield of b were correspondingly higher than those of a (mixed stand). Except for number of full grains per panicle in Chen Chu i No. 11, the number of grains and number of full grains per panicle were higher in b than corresponding values in a for the same rice variety. The variety Red Plum Zao gave the best yield in both treatments. As regards to sugarcane growth, no obvious difference was observed in interrows with or without rice growing. Higher rice yields could be expected by increasing rationally the interrow area devoted to rice on condition that the sugarcane yield would not be affected.

TRIAL ON THREE RICE CROPPINGS PER ANNUM

7.26.16. The experiment was started on 15th July, 1976 and is expected to end in June, 1977 for the first trial.

First cropping (15th July—15th November, 1976)

Area 0.34 arpent (0.14 ha.) in 2 fields

Rice variety Kwang Loo i No. 4

Date sown 15.7.76

Date transplanted 13.8.76

Growth duration 123 days (from sowing to harvesting)

94 days (from transplanting to harvesting)

7.26.17. The first cropping produced 3.17 tons of paddy per arpent (7.51 tons/ha.). The experiment is still in progress.

VEGETABLES

7.26.18. The following vegetables were grown and their yields tabulated below:—

TABLE 14

YIELDS

Particulars	*Planting date*	*Area m²*	*Total yield kg.*	*tons/ha.*
White gourd	18. 9.76	34.2	105.3	30.79
Bean (local)	1.11.76	17.1	43.9	25.67
Bean (You Ching) ...	1.11.76	17.1	36.7	21.46
Bean (Sijitsai)	1.11.76	17.1	35.6	20.82
Bean (tie hsien ching) ...	1.11.76	17.1	40.1	23.45
Cucumber	9.11.76	34.2	seeds	seeds
Bitter gourds	10.11.76	68.4	seeds	seeds
Wax gourd	10.11.76	68.4	485.7	71.01
Chich-qua gourd ...	16.11.76	34.2	161.7	47.28

SWEET POTATO

7.26.19. A randomised complete block design with three replicates to compare the performance of nine Chinese sweet potato varieties was carried out in the second half of the year. Each plot size was 10 m^2.

RESULTS

TABLE 15

FRESH TUBER YIELDS

Variety	*tons/arpent*	*tons/ha.*
Chain 64–285 ...	32.83	77.79
Chow Nung 69–219 ...	27.98	66.29
Kwang Tung 16 ...	25.95	61.49
Yue 70–9	22.96	54.39
Little Leaf	22.41	53.09
Leek	21.99	52.09
Chestnut	18.82	44.59
Peking	18.06	42.79
White Starch	15.11	35.80

7.26.20 The highest yielding variety was chain 64–285 followed by Chow Nung 69–219 and Kwang Tung 16. The differences in yield between these 3 varieties and the 6 others were highly significant. Varieties Yue 70–9, Little Leaf and Leek had better taste than the others.

EDIBLE STRAW MUSHROOM

7.26.21. Five trials of rice straw mushroom cultivation were conducted from 5th July to 20th December 1976. A total of 710 kg. of dry rice straw was used and 77.75 kg. fresh straw mushroom harvested giving an average yield of 10.95 kg. fresh mushroom per 100 kg. dry rice straw.

7.26.22. Fruit trees

CITRUS

7.26.23. The majority of the citrus trees having their scions treated with antibiotic tetracyclin at time of grafting for observation to control greening disease, were growing well. They are expected to bear fruits next year. There were 161 citrus trees in all comprising 129 orange, 20 tangelo, 10 ponkan and 2 lemon trees.

PAWPAW

7.26.24. 84 pawpaw seedlings of the Chinese Lien-nan variety and 30 of the local variety were transplanted in August and September. The Lien-nan variety flowered 3 months after transplantation, whereas those of the local variety took 3 to 4 months to do so. Fruits are developing well and expected to be ready for harvest in April next year.

VIII. Plant Pathology Division

Head of Division: G. M. Lallmahomed, Divisional Scientific Officer

8.1. The Plant Pathology Division is responsible for the prevention and control of plant diseases. Phytosanitary control is exercised at ports of entry to prevent entry of foreign plant pests and diseases on imported plant material. Plant material is also examined for freedom from pests and diseases prior to export. Reseach was carried out mainly on bacterial wilt strain variation, on the control of ginger blight and on virus diseases of tobacco and chilli, New crop introductions were also assessed for resistance to main diseases.

RESEARCH INVESTIGATIONS

BACTERIAL WILT (*Pseudomonas solanacearum*) STRAIN VARIATION—

G. M. Lallmahomed and N. Yerigadoo.

(a) ROTATION EXPERIMENTS

8.2.1. Further experiments were performed to study the effect of cropping sequences on the incidence of bacterial wilt. The incidences of bacterial wilt on the various crops at Reduit are indicated in Table 1. Figures indicate mean percentage values of wilted plants.

TABLE 1

INCIDENCE OF BACTERIAL WILT ON VARIOUS CROPS FOLLOWING DIFFERENT CROPPING SEQUENCES

Cropping sequence	*Nov. 73–Mch. 74*	*April–Sept. 74*	*April–Sept. 75*	*May–Sept. 76*	*Oct. 76–Feb. 77*
Groundnut (Shulamit)—Groundnut—Tomato (Local)—Tobacco (Yellow Mammoth)—Tobacco YM ...	0[e]	0.41[e]	100[a]	9.0[e]	57.0[b]
Tobacco YM — Tobacco YM — Tobacco YM — Tobacco YM — Tobacco YM	15.0[c]	41.9[b]	76.45[b]	85.0[c]	98.0[a]
Fallow—Fallow—Potato (up to date) —Potato UTD—Tobacco YM ...	—	—	42.4[c]	100[a]	23.0[c]
Tomato — Tomato — Groundnut — Groundnut—Tobacco NC95 ...	77.3[a]	100[a]	2.75[f]	15.75[d]	16.0[c]
Potato (Resistant) — Potato (R)— Bean—Tomato—Tomato ...	3.46[d]	9.73[d]	8.61[e]	99.5[a]	100[a]
Bean—Bean—Potato (R)—Eggplant (Black-Beauty)—Potato (up to date)	0	2.95[e]	29.12[d]	92.75[b]	100[a]
Potato UTD—Potato UTD—Fallow —Fallow — Tobacco Yellow Mammoth	49.5[b]	31.0[c]	—	— —	17.0[c]
S. Error of difference between means	±0.18	±3.69	±0.32	±0.68	±1.08

8.2.2. Results indicate that continuous cropping under tobacco increases the virulence of the bacteria towards that host probably through a selection process. There was no significant difference in the incidence of bacterial wilt on tobacco following two fallow seasons or two susceptible potato seasons although the latter was extremely susceptible during a second crop.

(b) ANTIBIOTIC SENSITIVITY TESTS

8.2.3. Variations having been reported in the antibiotic sensitivity to *Pseudomonas solanacearum*, some 75 local isolates were tested for their sensitivity to 14 different antibiotics using single and multo-discs. All our isolates were uniform in their reactions to the antibiotics tested. Results are shown in table 2.

TABLE 2

ANTIBIOTIC SENSITIVITY OF LOCAL ISOLATES OF PSEUDOMONAS SOLANACEARUM

Antibiotic —	*Reaction*	*Antibiotic* —	*Reaction*
Erythromycin 5 μg	S	Chloromycetin 5 μg	R
Kanamycin 5 μg	S	Chloromycetin 10 μg	WS
Streptomycin 10 μg	S	Chloromycetin 30 μg	S
Penicillin G 1.5 units	R	Vancomycin 10 μg	R
Novobiocin 30 μg	R	Vancomycin 30 μg	R
Nystatin 100 units	R	Oleandomycin 5 μg	WS
Neomycin 5 μg	R	Oleandomycin 10 μg	WS
Colymycin 5 μg	R	Oleandomycin 30 μg	S
Oxytetracycline 10 μg	WS	Tetracycline 10 μg	WS
Oxacillin 1 μg	R	Tetracycline 30 μg	WS

R = Resistant—Zone of inhibition absent or insignificant

S = Sensitive—Wide zone of inhibition (10 mm)

WS = Weakly sensitive—Zone of inhibition (3–5 mm).

8.2.4. Our isolates were uniformly susceptible to Choromycetin and Oleandomycin and resistant to Vancomycin. The tobacco race could not therefore be differentiated from the potato race on the basis of antibiotic sensitivity to Chloromycetin and Vancomycin contrary to current procedure elsewhere.

New host records of Pseudomonas solanacearum

Pseudomonas solanacearum was newly recorded on three weed hosts:—

Acalypha indica (Herbe chatte)

Ludwigia octovalvis (Herbe gandia), a common weed in marshy areas

Solanum auriculatum (Tabac marron)

All the above isolates belong to the potato race and biotype 3.

GINGER BLIGHT

Pyricularia sp.—M. Pillay & M. Chinappen

8.2.5. Little time could be devoted to research investigations on the fungal pathogens causing the blight of ginger and turmeric during the year. Morphological studies were, however, initiated.

8.2.6. A randomized block design was used to evaluate the efficacy of different rates of application of Dithane M/45 in controlling the ginger blight caused by *Pyricularia* sp. (*zingiberi*?). The experiment was set up at Dubreuil DWC, mixed farming site. Blight symptoms which were first noticed in early February had become widespread by mid-april. Assessment of disease severity was made every fortnight but this had to be stopped halfway owing to a severe outbreak of bacterial soft rot in the area which also included the experimental plot. The experiment was continued despite this setback but treatment differences in yield at harvest were not significant.

Tobacco virus diseases—M. I. Dossa and S. Benimadhu

8.3. A survey of virus diseases of tobacco was undertaken and 34 fields were visited in the districts of Pamplemousses, Riviere du Rempart and Flacq. Tobacco mosaic virus (TMV) was prevalent in nearly all fields visited and was most severe on the plantation of St. Andre S.E. Co. Ltd. at Solitude where over 70% of the plants were infected. Symptoms of other virus diseases were not seen although a single suspected case of cucumber mosais virus on *Nicotiana tabacum* var. NC 95 is under investigation.

8.3.1. Tobacco mosaic virus was identified from the specimens collected at Triolet, Tyack, Solitude and Bel Air by mechanical inoculation of sap to different test plants. In each case the results failed to indicate the simultaneous presence of a second infecting sap-transmissible virus other than TMV. In a further attempt to determine whether cucumber mosaic virus could also be present, gel-diffusion tests were conducted using as antigen the infected sap of *Nicotiana tabacum* var. NC 95 from Solitide. The antigen was made to run separately against TMV and CMV antisera. The results, summarised below, indicate the presence of only TMV.

			Antiserum Dilutions								
Antigens		*Antisera*	*1:4*	*1:8*	*1:16*	*1:32*	*1:64*	*1:128*	*1:256*	*1:512*	*1:1024*
Infected sap	...	TMV	+	+	+	+	+	+	+	+	+
		CMV	—	—	—	—	—	—	—	—	—
Healthy sap	...	TMV	—	—	—	—	—	—	—	—	—
		CMV	—	—	—	—	—	—	—	—	—

+ = band formation in agar

— = no band formed

WEATHER FLECK

8.3.2. Leaves of *N. tabacum* var. SC 66 (from La Nouvelle Industrie) showing necrotic spotting were brought to this Division for identification of pathogens, if any. The leaf spots were found to be non-parasitic and tests to detect viral and fungal pathogens were negative. The general symptoms and more specially leaf spot distribution were suggestive of " weather fleck ". Subsequent field visits revealed that younger leaves showed brown flecks only at the tips whereas lower basal leaves showed closely aggregated spots that have changed from brown to white. Larger necrotic areas on the lower leaves would appear to result from the coalescence of smaller white necrotic spots.

8.3.3. Symptoms identical in leaf spot distribution and disease severity have been observed on the same variety of tabacco at Providence, Pont Blanc and Petite Riviere.

8.4. *Virus diseases of chilly*—M. I. Dossa and S. Benimadhu

8.4.1. *Potato virus X*

Potato virus X has been detected on infected *Capsicum annuum* var. Chinese Giant (from Abercrombie Station) showing leaf deformation symptoms. Virus identification was based on host and serological reactions.

8.4.2. Young test plants bearing 4–8 leaves were dusted with carborundum mesh 600 prior to inoculation of sap which was prepared according to the method of Conti &Co-workers, i.e., the leaves were crushed in 0.01M Phosphate buffer pH 7.0 containing sodium thioglycollate, diethyldithio-carbamic acid (DIECA) and disodium ethylenediaminetetra—acetic acid (EDTA). The differential hosts used in greenhouse inoculations consisted of *Datura stramonium*, *Chenopodium amaranticolor*, *C. annuum* var. Chinese Giant, *Gomphrena globosa*, *Nicotiana tabacum* vars. Yellow Mammoth and NC 95, *Solanum tuberosym* var. Up-To-Date and *Nicotiana glutinosa*. The identification ofPVX was based on reactions shown mainly by *Datura stramonium*, *C. amaranticolor*, and *Gomphrena globosa*. The identity of PVX was comfirmed by microprecipitin tests under mineral oil.

ASSESSMENT OF RESISTANCE TO MAIN DISEASES IN VARIOUS CROPS

N. Yerigadoo, D. Tourabally & G. M. Lallmahomed

SWEET PEPPER

8.5.1. A bacterial wilt and rootknot nematode assessment was performed on plants in a sweetpepper observational trial conducted by the Agronomy Division in April 1976. Bacterial wilt infection was based upon counts of wilted plants during the growing season.

Rootknot nematode damage was assessed at harvest when plants were uprooted and examined for the degree of root galling according to the infection classification of Zeck. Results tabulated below indicate good disease tolerance of variety Dunputh in bacterial wilt and nematode infested soils.

Variety	*Bacterial wilt infection %*	*Nematode Index**
Keystone Resistant	65.8[a]	3.76[b]
Dunputh	20.0[b]	9.66[b]
California Wonder	32.4[b]	35.24[a]
Chinese Giant	62.6[a]	8.52[b]
S.E. of difference between means ...	±1.62	±3.70

Small letters indicate Duncan's multiple range groupings of treatments which do not differ significantly.

EGGPLANT

8.5.2. Six eggplant varieties were evaluated for bacterial wilt tolerance in a variety trial conducted by the Agronomy Division at Pamplemousses Experiment Station from October 1975 to March 1976. Five scorings for wilted plants were performed during the growing season. Mean percentage values of wilted plants tabulated on the next page indicate tolerance of the local variery Cipaye Narain to bacterial wilt.

Variety	*% wilted plants*
Black Long	100
Purple Long	100
New York Spineless	100
Valencia Black	100
Farcie	70
Cipaye Narain	33

*Zeck, W.M. 1971. A rating scheme for field evaluation of rootknot nematode infestations. *Pflanzenschutz Nachrichten* Bayer, **24**, 141–144.

TOMATO

8.5.3. Fourteen varieties of tomato were assessed for resistance to a few important diseases in observational trials conducted by the Agronomy Division at Richelieu and Pamplemousses Experiment Station. Inoculations were also made under greenhouse conditions using isolates of *Stemphylium solani*. The local pomme d'amour was included in the tests for comparison purposes. Results are tabulated below:—

Variety	*Bacterial wilt (Pseudomonas solanacearum)*	*Gray leafspot (Stemphylium solani)*	*Mosaic (Virus)*	*Rootknot disease (Meloidogyne spp.)*
Heinz 1370	S*	R	S	T
Heinz 1350	S	S	S	T
Venus	T	T	R	T
St. Pierre	S	S	S	S
Geantekaki	T	S	S	S
Marmande	S	S	S	S
Saturn	T	R	R	T
Anahu	S	R	S	R
Moneymaker	S	S	S	T
Regina hybrid ...	S	T	R	R
Marglobe	S	S	S	T
E. S. 24	S	R	T	R
Marianne	S	S	S	R
Pomme d'amour locale ...	S	S	S	S

TOBACCO

8.5.4. Newly introduced tobacco varieties were assessed for resistance to rootknot nematodes (*Meloidogyne* spp.) in variety trials conducted by the Agronomy Division at Richelieu Experiment Station during the first tobacco season. Rootknot nematode damage was assessed after final harvest in August when plants were uprooted and observed for the degree of root galling according to the classification system of Zeck cited earlier. Results are tabulated below.

Variety	*Mean disease index*	*Disease resistance to:* *Rootknot nematodes*	*Bacterial wilt*	*Black shank*	*Tobacco Mosaic Virus*
NC 95 ...	0.78[a]†	High	High	Moderate	Susceptible
SC 66 ...	0.45[a]	High	High	Resistant	Susceptible
Speight 28 ...	0.69[a]	High	High	High	Susceptible
Coker 347 ...	0.54[a]	High	Moderate	Moderate	Susceptible
SC 72 ...	0.89[a]	High	Moderate	Moderate	Resistant
Speight 33 ...	2.36[b]	Moderate	Moderate	Moderate	Susceptible
SC 71 ...	2.69[b]	Moderate	Susceptible	Moderate	Resistant
SCR	4.17[c]	Moderate	not available	Moderate	Susceptible
Yellow Mammoth	2.34[b]	Moderate	Susceptible	Moderate	Susceptible
L.S.D. = .05 ...	0.89				
.01 ...	1.20				

*R = Resistant; T = Tolerant; S = Susceptible

†Small letters indicate Duncan's multiple range groupings of treatments which do not differ significantly.

Results indicate moderate susceptibility of the variety SCR to rootknot nematodes. Moreover, it was observed that varieties SCR and Coker 347 were moderately susceptible to black shank and powdery mildew. Known reactions of those introduced varieties to main diseases are also indicated in the above table.

8.5.5. *Tobacco mosaic virus*: M.I. Dossa and S. Benimadhu

Newly introduced tobacco varieties, namely Speight G-33, SCR, Speight G-28 and Coker 347 were tested against tobacco mosaic virus under greenhouse conditions. All varieties were susceptible to the virus.

QUARANTINE SERVICES

8.6. During the year, 769 import permits were issued for the importation of plants and 3463 phytosanitary certificates were delivered for the exportation of ginger, fresh flowers, aquatic bulbs and various ornamentals. 600 landing permits were issued on behalf of the Division of Veterinary Services prior to the landing of imported frozen animal products. At the Parcels Post Office, 71 items of plant material were intercepted, 20 were destroyed, 27 were released after treatment and presentation of the appropriate phytosanitary certificate, 10 items were allowed to undergo a quarantine period before release and one item was returned back to its country of origin. The remaining items are still awaiting collection.

8.6.1. Phytosanitary control was as usual exercised during the arrival of 2580 planes and 297 ships. Out of 1079 items of plant and animal material intercepted at the airport, 27 were released after receipt of the appropriate documents, 10 were quarantined before release and 1042 were destroyed. 14 active growth inspections were carried out for the certification of fresh flowers before export. Fees collected amounted to Rs 7,715.—, treatment and active growth fees amounted to Rs 835.— and Rs 6,880.— were collected for phytosanitary and inspection certificates.

8.6.2. Legislation (Plants Act 12 of 1976) relating to plants and plant diseases, to implement the International Plant Protection Convention 1951 and to make better provision for the protection of plant life was passed in the Legislative Assembly on the 18th May 1976. The Plants Act 1976 came into force on the 24th July 1976. Regulations (Government Notice 101 of 1976) relating to Plants importation and exportation was made on 21st July 1976.

8.6.3. Plants introduced into Mauritius and released from quarantine during the year included the following:

Banana suckers CV. St. Jacques from Seychelles

71 varieties of Rice from Madagascar

24 varieties of Rice from China

15 varieties of Rice from Philippines

Ginger from Kenya and Jamaica

5 varieties of strawberry from Australia

1 variety of strawberry from France

3 varieties of mulberry from India

20 cuttings each of *Pennisetum purpureum* and *P. americanum* from South Africa

OCCURRENCE OF DISEASES

GINGER

8.7.1. *Pyricularia* blight of ginger was severe in all ginger-growing areas this season. Control by Dithane M–45 sprays were often seriously handicapped by continuous rainfall during the infective stage.

8.7.2. Several plantations in the superhumid and humid regions of the country suffered widespread attack by bacterial soft rot (*Erwinia spp.*) following heavy rains.

8.7.3. Bacterial wilt caused by *Pseudomonas solanacearum* was observed, for the first time after many years, in Pamplemousses and Dubreuil. This isolate from ginger belonging to biotype 3 should not be alarming as it is not the ginger pathotype (Biotype 4) which is not known to occur in Mauritius.

OKRA

8.7.4. Damage by the root-knot nematode *Meloidogyne* sp. on okra occurred in several localities. The most serious infection was noted in Richelieu.

GROUNDNUT

8.7.5. Groundnut rust, *Puccinia arachidis* assumed epidemic proportions and was observed all over the country during the year.

TEA

8.7.6. A localized case of charcoal stump rot was observed in Wooton.

BEANS

8.7.7. Halo blight was severe in all localities during the year.

TOMATO

8.7.8. Bacterial wilt *(Pseudomonas solanacearum)*, *Stemphylium* leaf spots and blight *(Phytophtora infestans)* were of common occurrence.

8.7.9. More than twenty cases of alleged herbicide injury were investigated. The high incidence of damage to vegetable crops, particularly tomato, caused by spray drift of herbicides from sugarcane fields and road-tracks is becoming a cause for concern.

RICE

8.7.10. Rice-Blast *(Pyricularia oryzae)* was observed in all rice-growing areas but did not cause much concern.

NEW DISEASES

8.7.11. The following was recorded for the first time in Mauritius:—
Oxalis sp.: Rust — *Puccinia oxalidis* Diet. &Ell.

MISCELLANEOUS

OVERSEAS MISSION

8.8 The Divisional Scientific Officer was awarded a travel grant from the USAID to attend the 1st International Planning Conference and workshop on the ecology and control of bacterial wilt caused by *Pseudomonas solanacearum* held at North Carolina State University, N. Carolina, U.S.A. from July 18–23, 1976. The conference was sponsored by the University of Wisconsin, North Carolina State University and the International Society for Plant Pathology. A paper on strains of *Pseudomonas solanacearum* and current research on bacterial wilt in Mauritius was presented at the conference. The Divisional Scientific Officer was appointed as a Committee Member on a sub-committee with assigned responsibility for possible implementation of task force recommendations on disease resistance.

8.8.1. Mr M. Pillay, Scientific Officer, participated in the Government Consultation on the International Plant Protection Convention, 1951. This consultation, held in Rome from 15th to 19th November 1976, was convened to discuss proposed amendments to the International Plant Protection Convention of 1951.

8.8.2. A delegation comprising three Mauritian gunny bag exporters, the Divisional Scientific Officer (Entomology) and the Divisional Scientific Officer (Plant Pathology) visited the Malagasy Republic from 4–7th February 1976 to discuss the ban and conditions imposed by the Malagasy Plant Protection Services on the exportation of used gunny bags by Mauritian exporters. Fumigation with methylbromide under tarpaulin sheeting was accepted and the ban subsequently lifted.

STUDY LEAVE

8.8.3. Mr M. Pillay was awarded a Netherlands Government fellowship to follow the 5th International postgraduate course in Plant Protection held at Wageningen, Netherlands from 26th July to 12th November 1976.

8.8.4. Mr J. Bucha, Scientific Officer, was awarded a DANIDA fellowship to follow the Seed Pathology Course at the Danish Government Institute of Seed Pathology for developing countries and left on 25th August 1976.

IX. ENTOMOLOGY DIVISION

Head of Division: J. Monty, Divisional Scientific Officer

INTRODUCTION

9.1 The work of the Division continued to be concentrated on studies for the control of stable flies and on sericulture.

9.2. Significant advances have been made in stable fly research under the guidance of Dr. K. R. P. Singh, Entomologist recruited by the F.A.O. from the Indian Council of Medical Research, New Delhi.

9.3. Sericulture has entered a new phase with the operation of a development plan in which farmers are encouraged to produce cocoons which are purchased by Government at remunerative prices.

STAFF APPOINTMENTS, NEWS AND VISITORS

9.4.1. The two vacant posts of Technical Officer (Scientific) were filled in December by Mr Dunhawoor and Mr D. Aubeeluck, both holders of B.Sc. degrees from India.

9.4.2. The Divisional Scientific Officer travelled to the Malagasy Republic in January as a member of a delegation also composed of the Divisional Scientific Officer (Plant Pathology) and of exporters of used gunny bags to discuss the phytosanitary regulations governing the export of used bags over Madagascar. Meetings were held with officials of the Agricultural Authorities who requested that all consignments of used bags exported to Madagascar should be fumigated with methyl bromide. The Malagasy Authorities needed this treatment as a measure of protection against a Coffee insect *Stefanoderes coffeae*.

9.4.3. The Divisional Scientific Officer visited Reunion Island in October under the auspices of the " Comité de Collaboration Agricole Maurice-Réunion-Madagascar. " Of particular interest, were the biological control of *Citrus* Psyllids and the occurence of moderate infestations of stable flies localized in humid regions where sugar-cane in cultivated.

9.4.4. The following overseas visitors were received during the year:

Mr Kaufmann, Technical Representative from CIBA/Geigy, Tananarive, Malagasy Republic.

Mrs M. Rakotonahary, Inspector from Plant Protection Services, Malagasy Republic.

Professor T. O. Browning, Research Director I.C.I.P.E. Nairobi, (Department of Entomology, University of Adelaide, Australia)

Dr. Ardley, Technical Representative from Welcome Foundation (Australia)

Mr Chalmette, Technical Reprecentative Chevron Chemical Company.

Mr C. Hammes, Emtomologist, O.R.S.T.O.M. Malagasy Republic.

His Excellency British High Commissioner in Mauritius.

REPORT ON RESEARCH WORK

THE STABLE FLY RESEARCH PROJECT

9.5.1. At the end of the year, the UNDP withdrew its technical and financial assisstance from the project, because of finance problems resulting in the FAO expert, Dr. K. R. P. Singh, appointed under the project leaving Mauritius in November 1976.

9.5.2. The following reports work done by the team composed of the FAO expert Dr. K. R. P. Singh, the Divisional Scientific Officer Mr. J. Monty, the Scientific Officers Miss I. Balluck and Mr. A. Joomaye.

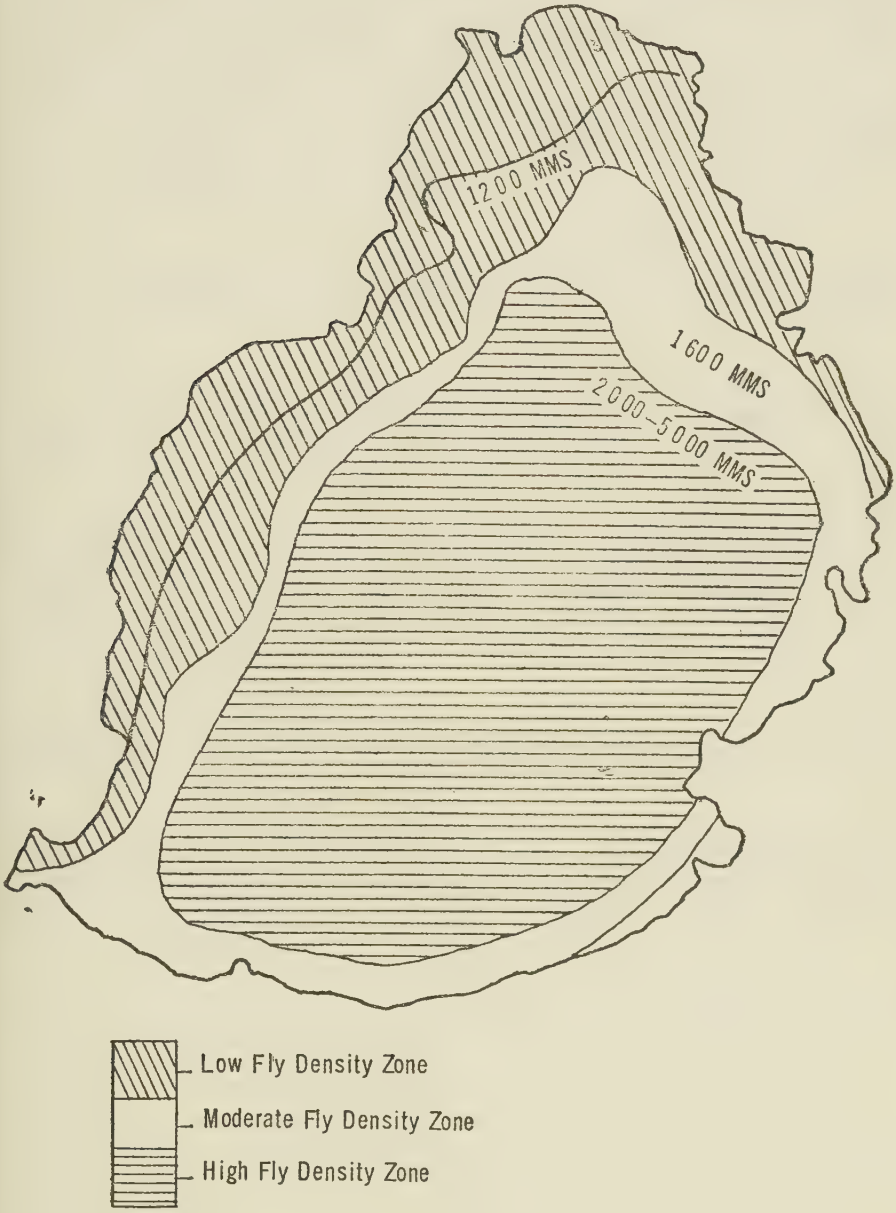
FIELD BIOLOGY AND ECOLOGY

DISTRIBUTION AND DENSITY

9.6.1. Distribution and density of *Stomoxys nigra* were further examined and various factors such as rainfall, temperature, evaporation and elevation etc. were considered as possible constraints on the distribution and the density of *S. nigra* on the island. In figure A, Mauritius is divided into three zones on the basis of annual rainfall. General observations about the distribution and the density of the fly fit very nicely in it.

FIGURE A

Stomoxys Nigra Density Zones and Rainfall



Areas with less than 1600 mm annual rainfall have a low fly density, areas with 1600 — 2000 mm rainfall have a moderate fly density and central areas on high elevation a high fly density. In figure B, the three zones based on annual rainfall are super-imposed by annual evaporation. From this map it is clear that low fly density zone (LFDZ) in addition to low annual rainfall has high annual evaporation of more than 1800 mm. In moderate fly density zone (MFDZ), annual rainfall and evaporation are very close(rainfall 1600 — 2000 mm and eavporation 1700 — 1800 mm), in high fly density zone (HFDZ) annual rainfall is much higher than the evaporation i.e. rainfall is 2000 — 5000 mm and evaporation 1400 to 1700 mm.

9.6.2. In figure C, average annual rainfall, average summer and winter temperatures, relief along direction of prevailing winds and *S. nigra* density zones are shown. This figure very clearly shows the relationships of densities of *S. nigra* with climate.

9.6.3. *Stomoxys nigra* breeds in moist decaying sugar cane leaves, green tops and pieces of discarded stalks, which are composted in between alternate rows of sugar cane after harvest. Low moisture contents in this material render it unsuitable for breeding of *S. nigra.*

9.6.4. If we look into the three zones it is evident from the annual rainfall and evaporation of these zones that the moisture in debris will be different, i.e. low in the LFDZ where evaporation rate is higher than the annual rainfall, moderate in the MFDZ where evaporation and rainfall are almost same and high in the HFDZ, where evaporation is 1,400 – 1,600 mm in comparison to 2,000 to 5,000 mm rainfall.

9.6.5. From the abovementioned observation it seems that distribution of *S. nigra* on the island is controlled by the annual rainfall and evaporation i.e. the moisture contents of the breeding material.

9.6.6. In Figure D, data collected from April to October 1976 by sticky traps on the relative density of *S. nigra* at various places is plotted in the three fly density zones. These data give very strong support to the conclusions drawn above and to the authenticity of the three fly density zones described above.

FIGURE B

Stomoxys Nigra Density Zones mean Annual Evaporation and Rainfall (mms)

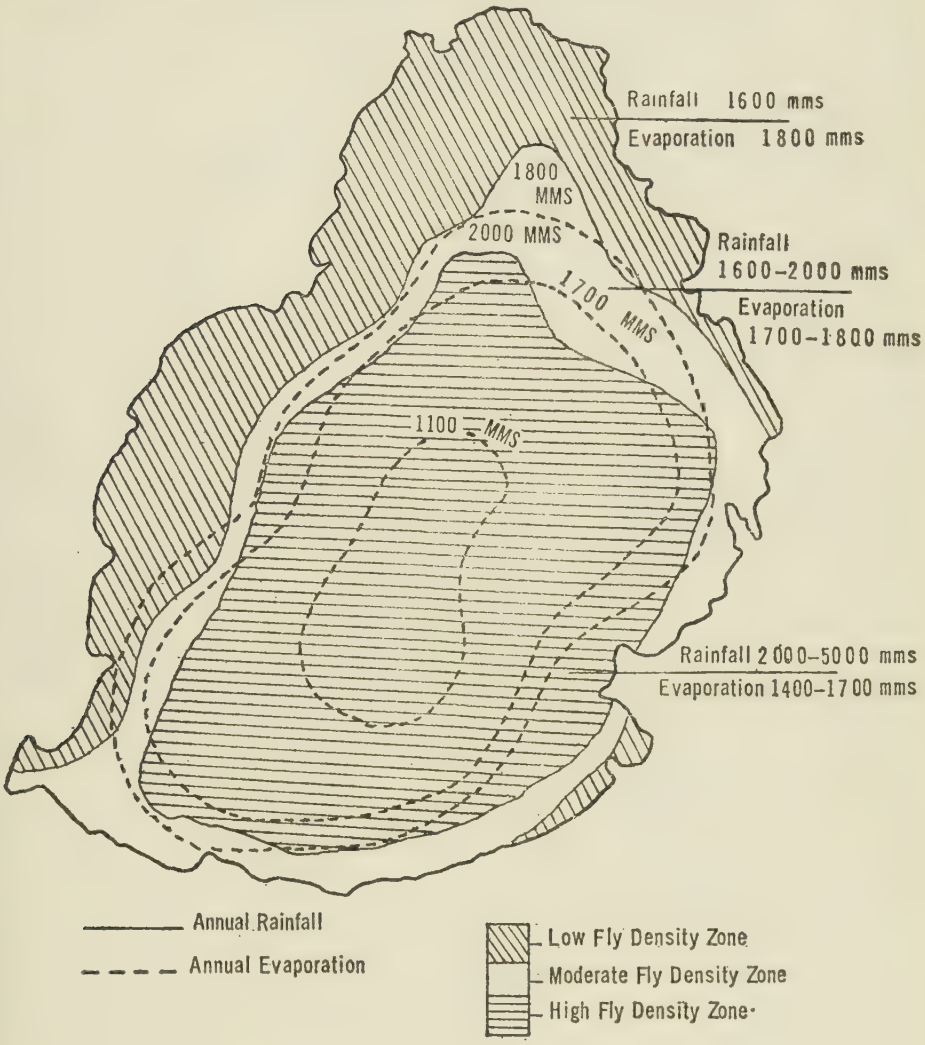


FIGURE C

Mean Annual Rainfall Evaporation (mms) Mean Temperature Mid Summer and Mid Winter (°C) and relief in meters along direction of prevailing winds—Southeast to West and **Stomoxys Nigra** Density Zones

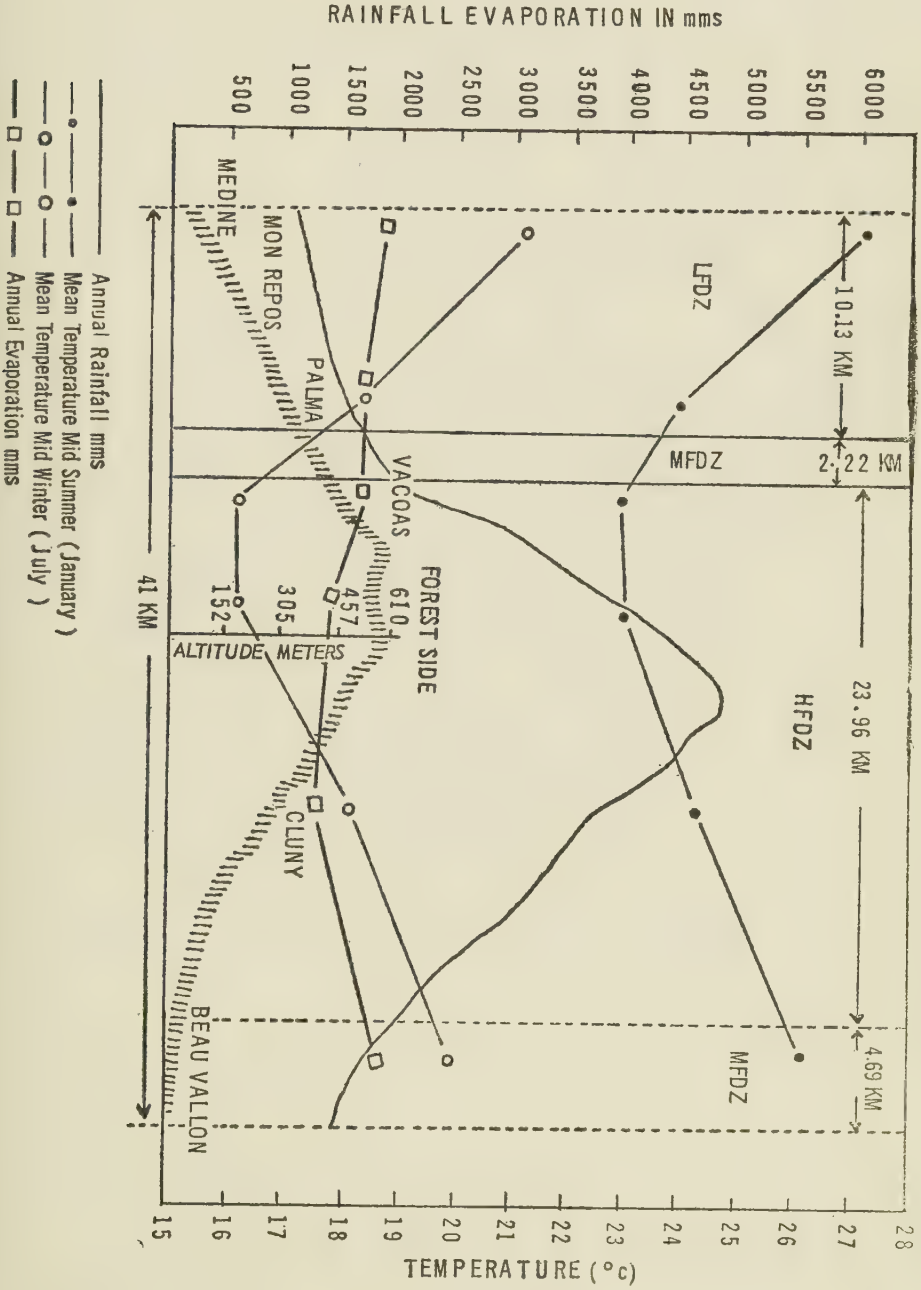
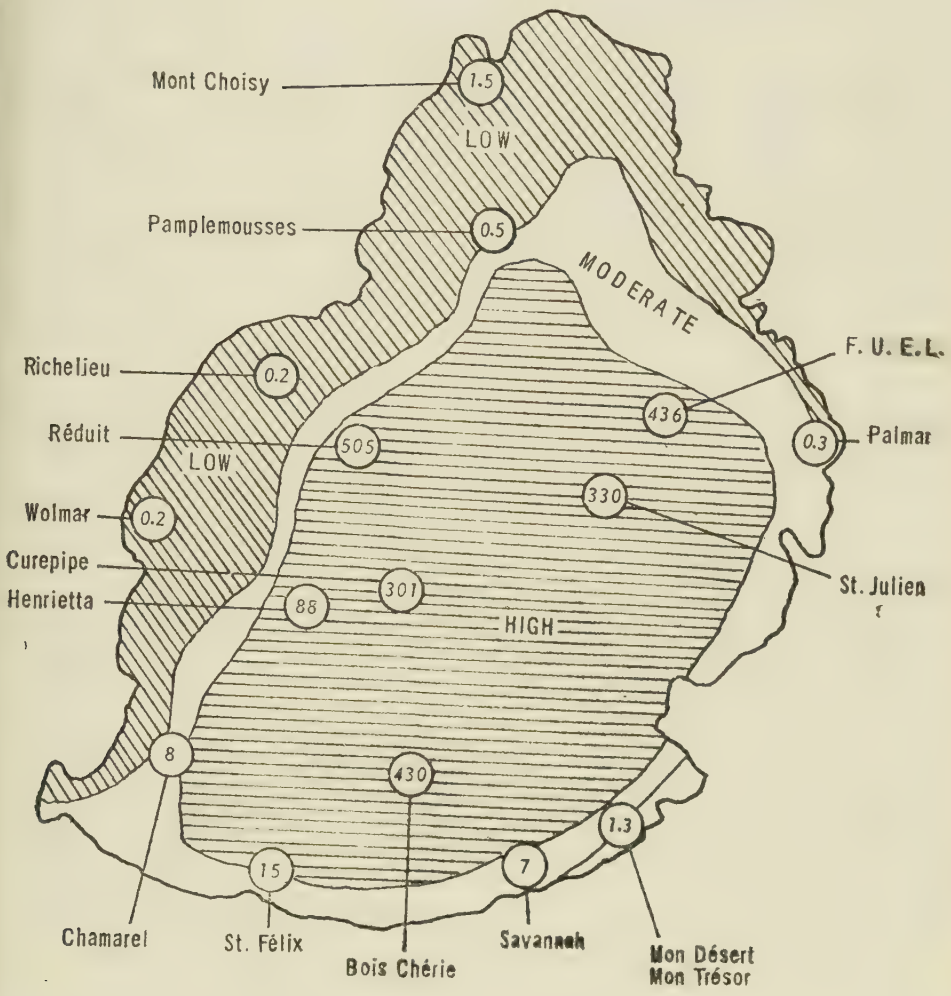


FIGURE D

Map showing **Stomoxys Nigra** per trap from April to October in three Fly Density Zones



POPULATION DYNAMICS

9.7. One of the prerequisites of sterile male technique is the estimation of the target population, so that the required ration of sterile to wild insects can be maintained. Two parameters can be estimated for this purpose: the absolute population or the daily emergence of adults in the target area.

9.7.1. Many techniques have been developed to measure the absolute population of insects, but *S. nigra* in Mauritius presents a very special problem. The adult flies concentrate in very high numbers around animals and it is difficult to observe them just 10 metres or so away from animals. Livestock distribution and concentration is very uneven. Therefore it would be very difficult to apply mark release recapture methods to estimate absolute population in the island. Direct counts on animals population estimates are also not possible due to the fact that the cattle in the high fly density zones are kept in byres. Therefore, it was considered better to estimate the daily emergence of *S.nigra* rather than the absolute adult population, by counting the number of pupae per unit. area.

ESTIMATION OF DAILY EMERGENCE OF STOMOXYS NIGRA

9.7.2. Henrietta Sugar Estate situated south of Vacoas township, almost in the centre of the country was selected for this study. The farm has 1,500 acres of land under sugar cane cultivation, out of which 1,000 acres are ratoon fields, which provides the breeding material for *S. nigra.*

9.7.3. To obtain a representative sample, the farm was divided into 15 more or less equal sectors. The plant-cane fields were excluded as these are not suitable for fly breeding due to the absence of decaying sugar cane debris in these fields. However, these fields after the first harvest when the straw was composted in them, were also included in the study and the newly planted fields were excluded. The farm was visited thrice a week and during each visit five sectors were searched for pupae. Thus all the sectors were visited once every week.

9.7.4. For search of pupae, a team of 10 workers was divided into five groups of two each. Each group was assigned to a particular sector, where they searched for pupae at random in 6–8 different rows in sampling unit of 10 square metres of straw in the fields. The data over one month period was used for analysis of daily emergence as average development time of *S. nigra* in Mauritius in favourable season is four weeks.

9.7.5. The following formula was used to calculate daily emergence on the basis of the data collected over the period of one month.

$$E = \frac{T : \frac{\text{Total number of pupae} \times N}{n}}{\text{Average duration of pupal period}}$$

T — Estimated total number of pupae
E = Estimated daily emergence of adults
n —Square metres of suitable bredeing site* searched
N = Total square metres of suitable breeding site*

9.7.6. The studies were started in February 1976 and the results are presented in table I

*As the decaying sugar cane debris is composted in one metre width in alternate rows three metres apart, one third of an acre was considered as suitable breeding site for every acre of sugar-cane.

TABLE I

ESTIMATES OF DAILY EMERGENCE OF STOMOXYS NIGRA ON HENRIETTA ESTATE

Month	*Square metres searched*	*No. of pupae found*	*Total No. of pupae expected*	*Average duration of pupal period (days)*	*Daily emergence*
February ...	1,340	336	338,337	10	33,834
March ...	2,110	205	131,095	10	13,110
April ...	3,792	83	29,534	10	2,953
May ...	3,778	61	21,786	10	2,179
June ...	2,098	82	52,738	13	4,057
July ...	1,320	51	52,133	13	4,010
August ...	3,570	519	196,162	10	19,616
September ...	3,900	384	132,856	10	13,286
October ...	1,750	265	204,326	10	20,433
November ...	1,750	162	124,878	10	12,488
December ...	700	15	28,907	10	2,891

ESTIMATION OF POPULATION OF S. NIGRA IN MODERATE AND HIGH FLY DENSITY ZONES

9.7.7. During the month of October 1976, efforts were made to estimate the daily emergence of *S. nigra* in moderate and high fly density zones. During this peroid 5035 square metres of suitable bredeing sites spread over 15 different area in two zones were seaeched for pupae. 497 pupae were collected. In thsee two zones 74,080 hectares are under sugar cane cultivation of which 64,820 hectares are suitable for fly breeding, the rest being "virgin fields". Using the formula mentioned earlier, daily emergence of *S.nigra* was estimated to be 2,124,326.

9.7.8. From the above preliminary studies on the estimates of daily emergence it is indicated that if a suitable sampling technique is developed and and mortality rate studied in the field, it will be possible to use this technique to get reliable estimates of daily emergence and absolute population for the island (vide 9.10.18).

STUDIES ON THE RELATIVE DENSITIES OF STOMOXYS NIGRA AT VARIOUS PLACES

9.7.9. Relative density studies were carried out by Kunz and Monty in 1973 and 1974 by counting flies on animals at two places in the country (Kunz and Monty, 1976). To extend this study to more areas, a survey of the island was made to find suitable sites where the animals are kept in the open at least for some time of the day. No suitable place for this study was available, even at one of the two places where earlier studies were carried out, the animals now being kept indoor. Therefore, it was decided to drop this technique, which in addition to its requiring animals stationed outdoor, reqiures a qualified person to go every time to the place to take counts which again might differ from person to person. Instead fluorescent yellow sticky traps, (which have been used elsewhere successfully for *Stomoxys calcitrans*) were selected as a technique for measuring relative densities of stable flies in the country.

TABLE II

RELATIVE DENSITY OF STOMOXYS NIGRA IN DIFFERENT AREAS OF MAURITIUS

No. of flies per trap

Zone / *Month*	*Low Fly Density*						*Moderate Fly Density*			*High Fly Density*						
	Mont-Choisy	*Richelieu*	*Wolmar*	*Palmar*	*Pamplemousses*	*Mon Desert*	*Chamarel*	*St. Félix*	*Savannah*	*Réduit*	*Henrietta*	*Curepipe*	*Bois Chéri*	*F.U.E.L.*	*Avarage for all zones*	*Rate of change*
April	—	0.0	0.33	0.0	0.0	—	—	0.33	2.0	25.0	10.0	20.7	—	6.5	6.49	—
May	—	1.0	0.33	0.33	0.5	—	—	3.75	2.25	31.25	21.5	9.5	—	1.0	7.14	1.10
June	3.5	2.67	0.67	0.33	0.33	—	—	0.67	1.67	12.67	20.33	12.0	2.5	2.33	4.97	0.7
July	0.0	0.0	0.0	1.0	0.33	0.0	2.33	0.0	0.0	83.33	11.33	1.0	7.0	4.0	7.88	1.59
August	0.0	0.25	0.0	0.0	0.0	0.0	0.6	0.0	0.8	15.75	3.2	0.4	0.8	0.5	1.59	0.2
September	0.6	0.0	0.5	0.25	0.0	5.0	21.25	96.0	52.5	1339.2	500.8	1353.3	12.375	1732.8	452.84	284.81
October	3.5	2.0	0.0	0.4	2.3	0.25	7.5	4.0	10.0	2026.3	46.5	710.8	904.3	1303.0	358.63	0.7
Average	1.52	0.85	0.26	0.33	0.49	1.31	7.92	14.96	9.89	504.8	87.67	301.1	430.4	435.7		

TABLE III

RELATIVE DENSITY OF STOMOXYS CALCITRANS IN DIFFERENT AREAS OF MAURITIUS

No. of flies per trap

Zone / Month	*Low Fly Density*						*Moderate Fly Density*			*High Fly Density*						
	Mont-Choisy	*Richelieu*	*Wolmar*	*Palmar*	*Pamplemousses*	*Mon Desert*	*Chamarel*	*St. Félix*	*Savannah*	*Réduit*	*Henrietta*	*Curepipe*	*Bois Chéri*	*F.U.E.L.*	*Avarage for all zones*	*Rate of change*
April	—	0.33	0.0	0.75	3.25	—	—	1.66	0.33	4.0	0.0	17.5	—	0.0	2.78	—
May	—	0.75	0.25	0.33	3.0	—	—	0.75	1.5	7.5	4.25	10.5	—	0.0	2.88	1.04
June	11.0	1.33	0.0	0.33	1.33	—	—	0.33	1.33	1.33	5.5	8.8	2.5	0.0	2.82	0.98
July	3.0	0.33	0.0	1.0	2.0	0.5	2.7	0.0	0.0	122.0	17.67	10.5	0.33	0.33	11.45	4.06
August	0.75	0.5	0.0	0.25	0.5	0.2	3.0	0.0	0.6	43.25	4.6	0.8	0.0	0.5	3.93	0.34
September	0.4	1.4	0.25	1.5	0.6	0.0	6.0	44.0	1.75	88.8	34.5	149.0	1.25	34.5	26.0	6.62
October	9.3	0.5	0.0	1.8	3.0	0.25	2.5	4.33	6.75	162.3	3.25	62.0	19.0	183.6	32.76	1.26
Average	4.89	0.73	0.07	0.85	1.95	0.24	3.55	7.30	1.75	61.31	9.97	37.01	4.62	31.28	11.82	0.36

9.7.10. Sticky traps (60 cm × 30 cm) were tried in the field by placing them on the outside walls of stables or byres where cattle were housed. It was observed that *S.nigra* will stick on the traps and if the traps are removed after 24 hours, the flies can be easily identified, sexed and dissected for insemination rates etc.

9.7.11. Sticky traps were set up at 10 places spread all over the island in April 1976 and by June, 4 more places were added to get evener distribution of the traps in the country. Six stations (Mon Choisy, Richelieu, Wolmar, Palmar, Pamplemousses and Mon Desert-Mon Tresor) were in low fly density zone (LFDZ); three, (Chamarel, St. Felix, Savannah) in the moderate fly density zone (MFDZ) and five (Reduit, Henrietta, Curepipe, Bois Cheri and FUEL) in the high fly density zone (HFDZ) (figure D).

9.7.12. Results of this study from April to October for *Stomoxys nigra* are given in table II, for *S. calcitrans* in table III.

9.7.13. Species composition, i.e. number of *S.nigra* trapped for every *S. calcitrans* is given in table IV. It was observed that the ratio *nigra/calcitrans* was 0.42 in the LFDZ, 2.7 in the MFDZ and 11.5 in the HFDZ.

TABLE IV

SPECIES COMPOSITION OF *STOMOXYS* IN THE THREE FLY ZONES

	S. calcitrans: S.nigra			
Month	*I Low Fly Density*	*II Moderate Fly Density*	*III High Fly Density*	*All*
April ...	1 : 0.08	1 : 1.17	1 : 2.89	1 : 2.33
May ...	1 : 0.50	1 : 2.67	1 : 2.84	1 : 2.48
June ...	1 : 0.54	1 : 1.41	1 : 2.75	1 : 1.77
July ...	1 : 0.21	1 : 0.73	1 : 0.71	1 : 0.69
August ...	1 : 0.13	1 : 0.37	1 : 0.42	1 : 0.41
September ...	1 : 0.33	1 : 3.36	1 : 20.00	1 : 17.42
October ...	1 : 0.56	1 : 1.57	1 : 11.61	1 : 10.96
Average ...	1 : 0.42	1 : 2.69	1 : 11.46	1 : 10.36

9.7.14. The density of *S.nigra* and *S.calcitrans* as expected was lowest in the low fly density zone and highest in the high fly density zone. Density of *S. nigra* was 42.5 times more in the moderate fly density zone than in the LFDZ, 15 times more in the HFDZ than in the MFDZ and 640 times in HFDZ than the LFDZ.

PRELIMINARY STUDIES ON THE DENSITY AND MORTALITY RATE OF *STOMOXTS NIGRA* POPULATIONS IN FIELD CAGES

9.7.15. La Brecque et. al., (1975) in their study on the density and mortality rate of *Stomoxys calcitrans* in field cages observed that for every fly resting or feeding on an animal there were about 55 flies in the cage and thus a relatively accurate estimate of *S. calcitrans* populations can be derived by correlating the average number of flies feeding or resting on a random sample of cattle in an environment to the total number of cattle in the vicinity. They also estimated daily mortality in the same experiments by taking daily fly counts on animals for five consecutive days. A daily loss rate of 25.3 per cent was derived over the five days period in the absence of emigration, migration and predation.

9.7.16. Similar studies were carried out to find the correlation of *S. nigra* feeding and resting on animals and in the environment and the daily mortality rates. The studies were carried out in out-door cages (12m. × 6m. × 2,5m.) each having a cattle stalled in it to serve as host for the flies.

9.7.17 In February 1976, 527 field collected flies were released in one cage, in March 600 flies in one cage and 1200 in the second. Counts of flies feeding or resting on animals were taken every two hour interval from 0600 hours to 1800 hours. Every time five counts were made on one side of the animal. To estimate the flies feeding or resting on one animal at one time, counts were doubled, added and average taken. Then all the average counts of the day were added and average taken and ratio calculated (Table V).

TABLE V

CORRELATION OF NUMBER OF FLIES RESTING OR FEEDING ON ANIMALS AND THE NUMBER PRESENT IN THE ENVIRONMENT

Average no. flies/animal/count	*No. flies in cage*	*No. flies in environment/fly/animal*	*No. of observations*
8.8	527	59.89	6
14.7	600	40.82	7
24.1	1200	49.79	7

9.7.18 Based on all the observations of the three experiments it was estimated that in this study one fly per animal represented about 50 flies in the environment. The figures is very close to the one for *S. calcitrans* derived at by La Breque et. al. (1975).

9.7.19. Daily mortality was studied only in one experiment in which 600 flies were released in a cage. Fly counts were made for six days after the initial count. Daily mortality of 18.1 per cent was estimated by averaging the daily mortality of six days. (Table VI).

INSEMINATION RATE IN FIELD POPULATION OF *STOMOXTS NIGRA*

9.7.20. To establish insemination rate in the field population of *S.nigra*, studies were started at Reduit. Flies were collected three times in a week at 3.00 p.m. with sweep net. Fifty female flies were dissected from each sample and spermathecae checked for the presence or absence of sperms. Later on this study was extended to other parts of the island. Flies trapped by sticky traps were dissected to determine the insemination rate. Minimum of 25 female flies were dissected from each trap. Results of the study are given in table VII. Average insemination during various months varied from 29.89 per cent to 57.24 per cent and at various parts of the island from 23.55 to 52.0 per cent. On the whole it can be said that 61.5 per cent of the island population of *S.nigra* is expected to be virgin at any time.

TABLE VI

DAILY MORTALITY OF *S. NIGRA* IN OUT-DOOR FIELD CAGE

Day	*Average no. flies/animal/count*	*Estimated no. of flies*	*No. dead flies*	*Percent mortality*
0	41	600	—	—
1	35	512	88	14.67
2	27	395	117	22.85
3	24	351	44	11.14
4	23	336	15	4.27
5	17	248	88	26.19
6	12	175	73	26.19
6	17	248	88	29.44

Average daily mortality = 18.09%

TABLE VII

INSEMINATION RATE OF *S. NIGRA* COLLECTED BY SWEEP NET AT REDUIT AND BY STICKY TRAPS AT VARIOUS STATIONS

	Per cent inseminated						
		Sticky Traps					
Month (1976)	*Sweep Net Réduit*	*Réduit*	*Curepipe*	*Henrietta*	*F.U.E.L.*	*Bois Chéri*	
April ...	27.90	27.80	31.3	52.4	30.8	—	34.04
May ...	21.86	30.9	31.8	35.0	—	—	29.86
June ...	24.67	33.3	33.3	43.3	—	—	33.63
July ...	25.73	31.8	—	52.0	28.6	20.0	31.17
August ...	22.33	40.0	—	—	—	—	31.17
September ...	18.54	19.00	53.3	31.9	58.7	70.0	41.91
October ...	23.83	58.0	74.7	51.3	69.9	66.0	57.24
	23.55	34.40	44.88	44.32	46.93	52.0	37.07

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USE OF " EXIT " TRAP FOR REDUCING FLY POPULATION INSIDE DARKENED ANIMAL HUTS

9.7.21. The straw huts which are used by cow-keepers in Mauritius are not fly proof, and relatively large numbers of flies get into the huts.. Though their activity is reduced inside the hut due to low light intensity, they are still a great nuisance to the animals. Therefore, it was considered important to develop some inexpensive technique to control flies inside the hut to provide some relief to the animals.

9.7.22. It is a well established fact that *S. nigra* adults are very much attracted to light. Efforts were made to exploit this habit of the fly to attract the flies inside the darkened hut to some type of trap. For this purpose " Exit " trap used in the studies on the behaviour of mosquitoes was tried. Exit traps $30 \times 30 \times 30$ cm cube made of G. I. wire and nylon screening with a cone shaped entry were fixed in a well illuminated wall of the cow-huts. Large numbers of flies were thus caught daily.

9.7.23. The efficiency of these traps still have to be worked out quantitatively in experimental huts. However, from these preliminary results it tis clear that not only these traps will be useful to give some relief to the animals in the huts, but have the potential to be used as a fly control technique on a country wide basis. In contrast to the chemical control which is expensive and difficult to implement on a country wide basis, the trap provides a cheap economical tool which can be used by the cow-keepers themselves in the huts without any danger of poisoning and pollution of the environment.

Biological Control—(Miss I. Balluck, Scientific Officer)

9.8.1. The Hymenopteran parasites *Tachinaephagus* sp. (Encyrtidae) and *Trichopria* sp. (Diapriidae) were multiplied in the laboratory and released in sugar-cane fields in various areas of the island. *Tachinaephagus* sp. is a larval/pupal parasite and *Trichopria sp.* a pupal parasite of *S. nigra.*

TABLE VIII

RELEASE OF PARASITES OF *STOMOXYS NIGRA* IN 1976

	Tachinaephagus sp.		*Trichopria sp.*	
Area	*Period of Release*	*No. Released*	*Period of Release*	*No. Released*
Bois-Cheri	Ootober	10,500	—	—
La Brasserie (Curepipe)	January	5,250	—	—
Flacq	October	19,250	—	—
Henrietta	March, September October	156,600	—	—
Mon Desert Mon Tresor	March, September ...	67,900	March	3,500
Melrose	October, November ...	51,800	—	—
Reduit	February to April September, October	67,200	March & October	11,720
Sans Souci	March	7,000	—	—
Savannah	September, October ...	21,980	March	3,500
Vacoas	February	7,000	—	—
St. Julien	January to April, September-October	202,250	October	7,000
Le Val	January, February, September, October	57,400	October	3,500
Valetta	January to May, September to November	160,260	January to May	45,500
St. Felix	October	7,000	—	—
Tyack	November	22,750	—	—
	TOTAL ...	864,140		74,720

EFFECTIVENESS OF THE PARASITES AT HENRIETTA

9.8.2. The pupas collected for the fly population estimate at Henrietta were kept for observations in the laboratory with the following conditions: Temperature: 25–27ŧC, R. H. 60–90%. The emergence of flies and parasites were noted daily and the pupae still remaining intact after a period of one month (parasites take 20–25 days to emerge in the laboratory) were dissected to determine whether they had been parasitised or not.

The results obtained after dissection of the pupae were included in the evaluation of parasitism as it is thought that they did not emerge as a result of mishandling and other unsuitable conditions in the laboratory.

Three species of parasites were recovered, viz.

1. *Tachinaephagus sp.* (Encyrtidae)
2. *Trichopria sp.* (Diapriidae)
3. *Spalangia sp.* (Pteromalidae)

The percentage parasitism was found to vary from month to month and with the samples collected at each visit. Table IX below gives the results obtained from February to November.

TABLE IX

PARASITISM IN PUPAE OF *STOMOXYS NIGRA* COLLECTED IN SUGAR-CANE FIELDS AT HENRIETTA. FEBRUARY — NOVEMBER 1976

Month	*No. of Pupae collected*	*Percentage Parasitism*			
		Total	*Tachinaephagus sp.*	*Trichopria sp.*	*Spalangia sp.*
February ...	196	58.5	41.3	13.8	3.4
March ...	196	58.7	57.5	1.1	0.2
April ...	49	35.0	20.2	8.4	6.5
May ...	49	49.0	47.7	—	1.3
June ...	79	53.4	41.7	8.8	2.9
July ...	47	35.0	33.8	1.2	—
August ...	519	13.1	6.3	6.3	0.5
September	947	22.1	17.9	4.1	0.1
October ...	2684	31.9	30.7	1.2	0.1
November	233	47.0	41.6	4.7	0.8
Average ...		40.4	33.9	5.0	1.6

9.8.3. Only two releases of *Tachinaephagus sp.* had been made at Henrietta before 1976: one in June 1974 and the other in August 1974. Two relesaes were effected in 1976, in March and in September. However, regular releases were made at La Brasserie, six miles away from Henrietta. The high percentage parasitism obtained in February and March 1976 suggest that the releases at Henrietta were highly effective or that the parasites released at La Brasserie might have gradually migrated into Henrietta.

9.8.4. *Trichopria sp.* was released once at Henrietta in July 1975 and regularly at La Brasserie during the same year. However, this parasite appears to be less successful than *Tachinaephagus sp. Trichopria sp.* occurred naturally at low densities before the introductions of parasites from Uganda. The insects from Uganda and Mauritius were found to be taxonomically identical, but the Ugandan strain was propagated in order to introduce genetic variability in the species.

RECOVERY OF PARASITES IN OTHER AREAS

9.8.5. Surveys of pupae of *S.nigra* were carried out in different localities comprising both the areas of release and areas where parasites were not released. The pupae collected were kept for observations. After the emergence of flies and parasites and dissection of unemerged pupae, the parasitism was evaluated. Table X summarizes the results of the surveys.

TABLE X

PARASITISM OF PUPAE OF *S. NIGRA* COLLECTED IN SUGAR-CANE FIELDS OF MODERATE AND HIGH FLY DENSITY ZONES

Area	*No. of Pupae collected*	*% of samples without parasites*	*Average % Parasitism*		
			Tachinaephagus sp.	*Trichopria sp.*	*Total*
East (4 localities; 11 samples) ...	688	91.	27.4	3.7	33.4 (3.3 to 58.7)
South (7 localities, 17 samples) ...	492	47.1	5.0	3.9	9.7 2.1 to 41.7)
Central Plateau (8 localities, 27 samples	1820	0.	24.6	4.2	29.2 (3.3 to 71.9)

9.8.6. The highest average parasitism was obtained at La Brasserie, Curepipe (37.3%), Nouvelle Decouverte (45.5%) and Flacq (47.2%). These results are very satisfactory and indicate that the parasites have good dispersal ablilities and are well adapted ro find their hosts in the sugar cane fields. Of the two species studied, *Tachinaephagus sp.* is by far the more common and efforts will be concentrated on this species which is now established throughout the ecosystem occupied by the immature stages of *Stomoxys nigra.*

9.9. *Chemical Control* (Report of work done by Divisional Scientific Officer, J. Monty).

FOGGING TRIALS IN DEER PARKS

9.9.1. Trials to control stable flies in deer parks were made as from the month of October in two localities. Deer suffer considerably from stable flies in the humid areas of the island. The animals are wild and move through vast acreages of plains and forests where it is not advisable and economical to spray contact insecticides. The behaviour of stable flies causes them to aggresate on deer for feeding and thereafter rest on vegetation before flying away to breeding places in surrounding sugarcane fields. The flies are therefore always numerous around the animals and follow the herd along its trails. Late in the afternoon, the activity of the flies decreases considerably whereas at night they are completely motionless. The behaviour of the deer contrasts with that of the flies. During day-time, the deer may hide in dark, thick areas of the forest when flies are abundant. They will come to feed in open places late in the day and will move during the night, leaving behind the resting flies. It is not uncommon in the early morning to enter into swarms of hungry flies which seem to be waiting for a blood meal.

9.9.2. Under the conditions prevailing in deer parks, the control of flies by insecticides appeared to be possible only by the use of fogs to carry away insecticides with good knockdown properties. A swing-fog was mounted on the rear of a Land-Rover and delivered a fog containing pyrethrins and Dichlorvos. The vehicle moved along roads in the deer park at about 5 miles per hour to allow the fog to disperse behind under the very light breeze generally prevailling in summer in the late afternoon. The treatments were done twice weekly till the end of January, 1977. Fly counts could not be made in such forested areas, but the results were judged highly satisfactory by the absence of restlessness observed on the stags during the period of treatment. The effectiveness of the fog was tested by holding flies in chicken-wire framed cages exposed to the path of the fog. Knock-down of the flies immediately occurred, followed by death.

CATTLE TREATMENT IN OPEN PASTURE

9.9.3. A characteristic of Mauritian cattle management is the absence of pasture grazing on the Central Plateau. Past experience by the private sector as well as by the UNDP/FAO Meat and Milk Project (1968–1973) has shownth at cattle could not thrive in the open when high fly densities prevailed between October and March. Following the successful establishment of parasites of the fly *S. nigra*, a herd of 15 young bulls of the Creole type was kept in an open pasture at Curepipe, to observe whether the situation had evolved.

9.9.4. The animals were allowed to graze in open pastures during day time from 6.00 a.m. to 6.00 p.m. At night they were stalled in a shed. The bulls were given a ration of concentrated cattle feed in the afternoon, and otherwise grazed freely on relatively poor pastures. The trial started on 20th September, 1976 and was scheduled to end in December, 1977.

9.9.5. Fly counts were made on immobilized animals three times a week and samples of flies collected to determine species composition. Sprayingof the insecticicide Ciodrin was started on 3rd December when fly counts went above 200 per head. The insecticide was sprayed on the stalled animals in the early morning twice per week, using a knapsack power sprayer and at a concentration of 0.5%. The fly counts dropped significantly immediately after the treatments started and remained low (less than 75 per animal) during themonth of December. The animals (average weight at start was 110 kg.) gained weight steadily on an average of 460 gm. per day per animal for the period October-December 1976. Details of the trial will be available at the completion of the exercise. It is however possible to recommend that livestock may now be raised on an experimental basis in the open on the Central Plateau, provided that the animals are adequately protected with insecticides when necessary.

EXPERIMENTS TOWARDS THE USE OF THE STERILE INSECT TECHNIQUE

(Mr M. Ramsamy, Scientific Officer (Entomology)).

9.10.1. Three aspects of the *Stomoxys* research project were under taken:

(1) the mass rearing of *Stomoxys nigra*;

(2) continued studies on the laboratory biology of the stable fly; and

(3) studies on aspects of its ecology.

MASS REARING OF *Stomoxys nigra*

FOUNDATION OF A NEW FLY COLONY

9.10.2. About mid-February 1976, the 3-year old colony of *S. nigra* was found to have become heavily contaminated with *S. calcitrans*. It was therefore discarded. A new colony was founded about the end of February. To maximize genetic diversity, the parents of the new colony were selected from flies picked up from a wide variety of regions.

9.10.3. The wild flies laid masses of eggs whose development in the adopted larval medium (a mixture of 4 parts by weight of shredded elephant grass and 1 part by weight of soft wheat bran) proved spectacular. Calcutated from egg viability, pupation was over 75%. This leap in larval rearing efficiency at the very start of the new colony is undoubtedly the result of improved larval rearing facilities i.e.: constant temperature (29 ± 1°C); constant R,H. (70 ± 10%) and scrupulous cleanliness.

PRODUCTION OF PUPAE

9.10.4. A number of observations have been made towards the improvement of larval rearing technique and yield of pupae. The following inferences have been drawn:—

(1) Eggs spread evenly on the surface of the larval medium cause production of pupae to be higher than when they are seeded in one spot;

(2) Yield is significantly higher when a certain amount of food is supplied in two lots than when supplied all in one occasion. The best result is obtained when one feed is given on the day of seeding and a second one provided about 96 hours later, when the majority of larvae have reached the 3rd instar stage; and

(3) Yield is significantly higher when soft wheat bran (Pollard) is used instead of coarse wheat bran in the larval medium.

9.10.5. From the time eggs are seeded in the larval medium to the time when pupae are extracted, there is a lapse of ten days. The larval room, when in operarion at full capacity, can contain 400 trays. To keep daily production uniform, for such rearing facilities, 40 trays with freshly seeded eggs must be put in daily and 40 trays ready for the extraction of pupae must be removed. One tray, with the present rearing technique can contain medium for the development of 1 ml of eggs and can produce about 4.000 pupae (assuming efficiency to be roughly 40%). A return of 160,000 pupae is therefore expected daily.

PRODUCTION OF EGGS

9.10.6. Adults are kept in two rooms: room A which contains immature adults and room B with mature ovipositing flies.

9.10.7. Forty cages with freshly emerging flies may be daily put in room A and they may be kept there until the flies are 5 days old. At the beginning of the 6th day, the flies are transferred to the room B. Room A may therefore contain in all 240 cages at any particular instant; it may contain 40 cages of 0 day old adults, 40 cages of 1–day old adults.....and 40 cages of 5–day old adults.

9.10.8. Excluding working space, room B has a capacity of 280 cages. Every day, 40 cages of 6–day old flies may be put in and 40 cages of 11–day old flies removed. Any given female fly therefore can spend only a maximum of 7 days, its period of peak egg production, in room B.

9.10.9. When the two rooms are working at full capacity, egg production is in the order of 40 to 50 ml daily, i.e. 400,000 to 500,000 eggs par day.

NEMATODE CONTROL

9.10.10. From 1972, the time when the first Laborarory colony of *S. nigra* was successfully initiated, several species of nematodes have always been present at varying intensities in the larval medium. One of them, preliminarily identified as *Rhabditis sp.*, is particularly abundant especially during humid conditions. This nematode is thought to live on elephant grass, the principal ingradient of the larval rearing medium.

9.10.11 .When infestation is severe, the nematode larvae group into star shaped clusters and attach themselves around the buccal and anal ands of the stable fly larvae. The presence of the parasite in the medium has often been the cause of heavy larval and pupal mortalities. At several instances infestations were so severe that it was not possible to increase the size of the colony or to envisage mass production.

9.10.12. The threat to large scale production due to this laboratory pest, was eliminated when a very successful technique was developed for the control of nematodes from the colony.

9.10.13. The procedures outlined below, if followed in the routine rearing programme, keep the colony almost absolutely nematode free:

(1) Dip grass, on the eve of preparing the medium, in water treated up to 80°C for about 15 minutes;

(2) Use only water which has been boiled and allowed to cool for preparing the medium;

(3) Heat wheat bran, in an oven set at 80°C, for at least 2 hours before using it in the medium — this process also destroys stored product pests which are also abundant in the wheat bran;

(4) Immerse eggs into 4% formalin for 5 minutes then wash them thoroughly with water before seeding into the larval medium; and

(5) Boil oviposition pads and feeding pads after use.

CONTINUED LABORATORY BIOLOGY

EFFECT OF DENSITY ON FECUNDITY AND FERTILITY

9.10.14. Mature pupae were counted into batches of 500, 1000, 1500 and 2000 and adults allowed to emerge in 30 c.cm. cages. Daily observation was kept on egg production and egg fertility.

TABLE XI

EFFECT OF DENSITY ON FECUNDITY AND EGG VIABILITY

Density (No. of pupae)	*500*	*1000*	*1500*	*2000*
Mean female oviposition days* (for whole cage)	991	1443	1845	2504
Average eggs per cage	12,339	18,534	17,281	18,304
Mean egg/female oviposition day (or fecundity)	12.4	12.9	9.4	7.3
% fertility (or egg viability)	73.6	66.2	48.1	35.0

9.10.15. Table XI shows that egg production is not proportional to rearing density. Doubling the density does not cause egg production to double; in fact, when flies are reared beyond the density of 1000, egg production appear inhibited instead of enhanced.

9.10.16. It is not economical to rear flies at very low densities. Although fertility drops at the high densities, a compromise should be met by rearing at an optimum density which allows for the production of the maximum number eggs with a permissible level of sterility, viz. a density of 1000 to 1200 flies per per 30 cm^3 cages.

EFFECT OF PHOTOPERIOD ON *(a)* OVIPOSITION *(b)* EGG HATCH *(c)* PUPATION AND *(d)* ADULT EMERGENCE

9.10.17. Adult and immature stages were kept at 26 ± 2°C and 65 to 80% R.H. and subjected to the following light regime: 12 hrs of light phase (photophase) followed by 12 hrs of dark phase (scotophase). The effect of twilight was not taken into consideration for the experiments were carried out under artificial light which was controlled by an automatic time switch. The onset of the photophase was made to correspond approximately with the local dawn and the onset of the scotophase (at the time of the experiment) was made to extend slightkly beyond the afternoon twilight. Observations in the scotophase were made with the help of diffused red light.

(a) Oviposition

Flies lay mainly in the photophase. Oviposition starts about 10 a.m. and continues throughout the photophase and stops shortly after the onset of the scotophase. The number of eggs deposited in the morning is few. Peak oviposition occurs in the afternoon, about 2 to 4 p.m.

(b) Larval emergence

Eggs collected within the period of one hour, in the oviposition peak, were counted and set in petri dishes in a water saturated atmosphere and observed for hatching. Larvae started to hatch after 28 hours of incubation and hatching appeared to be independent of photoperiod. In the controls, which were left under continuous light, larval emergence with time was in no way altered. Peak egg hatch occurred after 32 hours of incubation while the last larvae emerged at 42 hours.

*The time from which females start producing eggs to the time of death.

(c) Pupation

Irrespective of the time of egg hatch, larvae tend to pupate at the onset of the photophase. The majority of larvae, whether emerged at 6.00 p.m., midnight or 6.00 a.m., pupate between 5 to 12 hours in the morning. A few pupate in the afternoon but none in the scotophase. Larvae of same chronoligical age failing to pupate in phase with the majority seem 'to wait' for the onset of the subsequent photophase to form their pupae.

(d) Adult emergence

Preliminary tests on the adult emergence pattern have revealed that eclosion is a rhythmic phenomenon dependent on photoperiod. Adults emerge only during the photophase and produce two peaks, one in the morning and another in the afternoon.

ECOLOGY OF *STOMOXYS NIGRA*

9.10.18. Two months after harvest, a ratoon field measuring about 2.5 arpents was chosen for the study of the distribution of a population of pupae. The field consists of 72 rows of sugarcane, each measuring 108 metres. Each of the sugarcane row alternates with either an interline of trash or a trash-free interline. A map was made of this field in which every square metre unit of trash is described by the count of pupae recorded in it after thorough *in situ* search. The counts were also summarized in a frequency distribution showing the number of sample units containing 1, 2, 3, ... (x) individuals.

9.10.19. Analysis of the frequency distribution showed that:—

(a) The population of pupae is not random but on the contrary shows a marked trend towards gregariousness according to a mathematical model known among ecologists as the nagative binomial distribution and *(b)* the population displays a very pronounced border effects.

9.10.20. Overdispersion or aggregation of pupae within the sugarcane trash is thought to be due to interactions of several factors, the most important being:—

(a) Differential mortality of the immature stages due to heterogenicity in the microclimate, viz. unevenness of soil topography, differences in height of trash, difference in rate of decay of straw, differences in trash distribution within and between interlines, differences in factors affecting the presence of predators and parasites, etc.

(b) Bahaviour of gravid females — females deposit eggs in batches and the hatched larvae can disperse through only short distances.

(c) Behaviour of larval stages — for development and maturation, larvae tend to collect in favourable areas. Pupae for instances, have been collected mainly in areas of the trash with high humidity content.

9.10.21. On the basis of the conclusions drawn from that experiment, a sampling programme has been developped for the efficient estimation of the absolute population of *S. nigra*.

9.11. Sericulture (N. K. Ganesh, Sericulture Expert and A. Joomaye, Scientific Officer).

9.11.1. Mr Ganesh, appointed as Sericultural Expert under Indian Technical, Economic and Cultural programme, came to Mauritius in November, 1975 to develop the Sericulture Industry. He introduced 3 varieties of mulberry and 3 pure races of silkworms from India in November, 1975. He also introduced new rearing techniques of feeding entire leaf and branches replacing the feeding of chopped leaf, thus cutting down the labour requirement in rearing by about 25%. The method of selection of cocoon on the basis of shape, size and silk content for breeding purposes was introduced.

MORICULTURE

9.11.2. During the year, there was about four acres of mulberry available for rearing and for supply of planting material to prospective sericulture farmers. This was extended to 12 acres as shown below.

Locality	*Area under mulberry (acres)*	
	1975	*1976*
Reduit	1.16	1.16
Curepipe	0.20	1.80
Nouvelle Decouverte	1.50	7.00
Plaisance	0.16	1.25
Barkly Experiment Station ...	0.50	0.50
Flacq	0.20	0.20
Rivière des Anguilles	0.16	0.16
Pamplemousses	0.10	0.10
TOTAL ...	3.98	12.17

9.11.3. In August, 1976, the Minister of Agriculture launched a project to encourage small and large planters to take up sericulture, by which all eventual planters would receive the following assistance:—

(a) Free planting material;

(b) Free silkworm of third stage;

(c) Rearing equipment on loan; and

(d) A guaranteed purchase price of Rs. 20 a kg. of cocoon.

9.11.4. Since then 195 farmers have registered their names to take up Sericulture. Almost all of them have been contacted and proper advice tendered to them. Out of the 195 farmers, 40 of them have already planted about 8 acres of mulberry in different localities. Free cuttings were provided to all the farmers.

9.11.5. The mulberry available locally may be broadly grouped into two categories; on the basis of nodal lenght;

(a) those having short internodes; and

(b) those having long internodes.

As far as possible, varieties with short internodes were propagated. The two Vietnam varieties introduced in 1974 also appeared to be promising and were propagated at Nouvelle Decouverte. Three new Indian varieties, namely S36, S54 and OP Hybrid introduced in November, 1975 are growing satisfactorily. These will be multiplied in the current year. The total area of mulberry is about 20 acres. Thsee will be utilized for rearing during the year.

SILKWORM REARING

PURE RACES (FOR EGG PRODUCTION)

9.11.6. During 1975, only 2 pure races of silkworm, viz. Nan Nung 6D and Kalimpong A were reared. In November 1975, two improved strains, Nan Nung 6D and Kalimpong A and a new race NB4D2 were introduced by the Sericultural Expert from the Central Sericultural Research and Training Institute, Mysore. During 1976, these five pure lines were reared at Reduit. These five lines have been given the following code names:—

MI (Kalimpong A — old line)

MII (Nan Nung 6D — old line)

MIII (Kalimpong A — new line)

MIV (Nan Nung 6D — new line)

MV (NB4D2)

M standing for Mauritius.

During the year 232 layings of pure race in the five different lines were reared in 8 crops and 77,149 cocoons (128,005 kgs) were harvested. The average yield was 55.2 kgs (33,250 cocoons) per 100 layings. This average is highly satisfactory.

REARING OF HYBRIDS

9.11.7. Hybrids of 11 combinations of the five pure lines were reared in the different stations and also by private rearers. The stations reared 640 layings and harvested 318.1 kgs with an average of 49.7 kgs per 100 layings. The best average yield of 60.2 kgs per 100 disease-free layings (DFL's) was obtained at Curepipe. The yield per 100 DFL's at Flacq, Plaisance and Reduit (field) was above 50 kgs.

PRIVATE REARERS

9.11.8. Among private rearers, Bois Cheri Tea Estate deserves special mention. The estate reared 263 layings in 5 crops, harvesting 154.11 kgs. of cocoons with an average of 58.6 kgs per 100 DFL's. This yield is very encouraging. Ten other farmers and one primary school at Rose Hill also reared a total of 125 layings and harvested 45 kgs of cocoons under Sericultural Project after the scheme was laucnhed in August. The average woks out to 36 kgs per 100 DFL's which is quite satisfactory, considering the lack of experience of the rearers.

SEED PRODUCTION

9.11.9. Out of 77,149 cocoons produced from the five pure lines, 18,257 were selected for preparation of layings. From these cocoons, 709 layings of the pure lines and 3,162 layings in 11 hybrid combinations were prepared. The supply of layings was 303 for pure races and 1,163 for hybrids. A few cases of flatcherie were observed. There was no incidence of Pebrine throughout the year.

9.11.10. The number of layings reared by Government and private rearers with the actual weight of cocoons and weight for 100 layings are summarized on the next page.

	No. of DFL's	Actual yield of cocoons/kg.	Yield of cocoons/100 DFL's
Government			
Pure races (Reduit) ...	232	128.0	55.2
Hybrids (Stations) ...	640	318.1	49.7
Private rearers			
Big rearer (Bois Cheri Tea Estate)	263	154.1	58.6
Small rearers (10) ...	125	45	36
TOTAL ...	1260	645	51.2 (overall average)

REELING

9.11.11. Experimental reeling continued on the existing machine to study the different cocoon characteristics.

EXTENSION

9.11.12. Extension work started before the project was launched. In the Agricultural Show which was held in July 1976, the Entomology Division (Sericulture) attracted a large number of visitors and it was a good opportunity to publicize the benefits of this industry. A mini exhibition was also organized at Saraswati Government School at Bramsthan, Flacq. Several talks, illustrated by live materials and photos were given at village council level to encourage people to start sericulture. Demonstration lectures were also delivered to members of the Young Farmers Club and to primary school teachers following a refresher course at the Institute of Education. The MBC/TV also interviewed Mr Ganesh about the prospects of Sericulture in Mauritius.

9.11.13. A film on the different aspects of Sericulture at rearer's level was shown. The first batches of cocoons produced by the farmers were officially purchased on 19th September, 1976 by the Honourable Minister of Agriculture at Reduit.

9.11.14. Farmers were given on request mulberry cuttings and silkworms of 3rd stage free of cost. Necessary technical guidance on planting and rearing of silkworms were also given to them.

X. AGRICUTURAL CHEMISTRY DIVISION

Head of Division: L. C. Lam Thuon Mine, Scientific Officer

STAFF MOVEMENT

10.1. Technical Officers, D. Chintaram and S. Bissessur joined the Division on the 4th November, 1976 and on the 18th December, 1976 respectively.

INTRODUCTION

10.2. The Division deals mainly with all the analytical work involved in the research programme of other divisions of the Ministry. In addition odd samples coming in from the private sector are analysed.

N. N. Ramanjooloo, Scientific Officer

SOIL

10.3.1. The Extension Service Division submitted 149 samples of soil taken on small planters' fields for the determination of pH and P,K in order to advise the planters on the appropriate fertilizer application. The results are summarized districtwise as follows.

(i) *pH*

In fair agreement with the agro-climatic conditions prevailing in the districts, it is found that the soil in Pamplemousses, Rivière du Rempart and Back River districts is only slightly acidic and that in the other districts is moderately acidic as shown in table I

TABLE I

ACIDITY OF SOIL IN DIFFERENT DISTRICTS

District	*pH range*	*Median pH*
Pamplemousses ...	5.1 — 6.8	6.0
Rivière du Rempart ...	5.8 — 6.6	6.0
Black River ...	6.1 — 7.3	6.5
Plaines Wilhems ...	5.0 — 6.1	5.6
Moka	5.4 — 6.2	5.5
Flacq	4.9 — 6.2	5.3
Savanne	5.3 — 6.1	5.5
Grand Port ...	5.1 — 6.4	5.7

(ii) *Phosphorus*

Although some isolated cases of soil samples with fairly high phosphorus levels (Between 175 and 200 ppm P) were met with in Plaines Wilhems, Flacq and Rivière du Rempart, the soil in all the districts seems to be poor in that element in its available form; a median of 20 ppm P can be taken as a fair representative average. Table (II) embodies the results obtained in terms of ppm P.

TABLE II

PHOSPHORUS CONTENT IN SOIL IN DIFFERENT DISTRICTS

District	*Phosphorus range ppm P*	*Median Value ppm P*
Pamplemousses	18 — 36	22
Rivière du Rempart	Trace — 48	21
Black River	Trace — 43	13
Plaines Wilhems	Trace — 32	Trace
Moka	Insufficient data	Insufficient data
Flacq	22 — 100	45
Savanne	Trace — 18	Trace
Grand Port	Trace — 50	19

(iii) *Potassium*

According to the results obtained it can be inferred that the average exchangeable potassium content in the soil of each district is of a satisfactory level, except that of Savanne and Pamplemousses which shows a low level below the critical value of 0.5 me/100 g of soil. Table III gives an overall picture of the results expressed in me/100 g of soil.

TABLE III

POTASSIUM CONTENT IN SOIL IN DIFFERENT DISTRICTS

District	*Potassium Range me/100g of soil*	*Median Value me/100g of soil*
Pamplemousses ...	0.36 — 0.45	0.42
Rivière du Rempart ...	0.44 — 1.50	0.97
Black River ...	0.23 — 1.85	1.03
Plaines Wilhems ...	0.23 — 0.73	0.51
Moka	Insufficient data	Insufficient data
Flacq	0.46 — 1.22	0.77
Savanne	0.19 — 0.44	0.31
Grand Port ...	0.15 — 1.01	0.85

10.3.2. 133 samples of soil were analysed in connection with the experiments conducted by the Agricultural Division. Details are shown in Table IV.

TABLE IV

VARIOUS SOIL DETERMINATIONS WITH RESPECT TO DIFFERENT EXPERIMENTS

Experiment	*No. of Samples*	*Determinations*
Fertilizer and Variety trial for rice ...	53	pH, N, P, K, O.M*
Fertilizer trial for tobacco	6	pH, N, P, K.
Fertilizer trial for onion	10	pH, N, P, K, O.M*
Fertilizer trial for lettuce	2	pH, N, P, K.
Response to phosphorus by tea planted in the presence of different mulchings ...	40	pH, P.
International Soybean Variety Evaluation	2	pH, N, P, K, O.M*
Soil regeneration	20	pH, N, P, K, Si

10.3.3. Samples of soil from Plant Pathology Division, Tea Development Authority, Tobacco Board and Central Water Authority were also analysed. Table V gives details of various determinations.

TABLE (V)

VARIOUS DETERMINATIONS ON SOIL SAMPLES FROM DIFFERENT SOURCES

Sender	*No. of Samples*	*Determinations*
Plant Pathology Division ...	1	organic matter, nitrogen
	2	pH, N, P, K, organic matter
	3	P, K, Ca
	1	NPK
	6	percentage of water
	2	water holding capacity
Tea Development Authority ...	20	pH
	3	pH, N, P, K.
Tobacco Board	3	pH, percentage of sand
Central Water Authority ...	11	percentage of Sulphate

*O.M. = organic matter

10.3.4. FERTILIZERS

10.3.5. CHEMICAL FERTILIZERS

The Mauritius Chemical & Fertilizer Industry (MCFI) submitted 7 samples of compound fertilizers for the determination of nitrogen, phosphoric acid and potash. Among these, a few samples were analysed for magnesium also. This is to check that each product conforms with its formulation. The results show that there is a discrepancy of $\pm 0.5\%$.

Different samples of fertilizers were also received from other sources for the determination of NPK values or for purity check. Table VI shows a summary of analyses carried out.

TABLE VI

ANALYSIS OF FERTILIZERS FROM DIFFERENT SOURCES

Source	*No. of Samples*	*Fertilizers*	*Determination*
MCFI	7	Compound	NPK, Mg
Sugar Estates	11	Compound	NPK, Mg
Extension Service Division ...	1	Compound	NPK
Rivière des Anguilles D. C. ...	1	Ammonium Sulphate	purity check
MCFI	1	Ammonium Sulphate	purity check
MCFI	1	Di-ammonium Sulphate	purity check
Tobacco Board	1	Ammonium Sulphate	purity check
Tobacco Board	1	Potassium Sulphate	purity check
Tobacco Board	1	Triple Superphosphate	purity check

COMPOST AND MANURE

10.3.6. (i) 3 samples of compost from the Agricultural Division, 2 samples of cow manure and 2samples of chicken manure from the Chinese Agricultural Team were received. They were analysed for nitrogen, phosphoric acid and potash in order to assess their fertility status.

(ii) From April 1976 to June 1976, the Extension Service Division undertook the collection of samples of cattle manure from 58 localities chosen at random throughout the island. During this period the laboratory received 109 samples of such cattle manure for the determination of total nitrogen, total and available phosphoric acid and total potash to assess their fertility status with a view to recommending the small planters on the correct dosage of manure application. As soon as the samples came in, their dry matter was determined and kept for analysis. However, this analysis could not be started until December, 1976 because of the heavy load of work already undertaken on soil and foliar diagnosis in sugarcane leaves from the same division.

WATER

10.3.7. Throughout the year, a total of 14 water samples from various sources were analysed. Details are shown in table VII.

TABLE VII

ANALYSIS OF WATER FROM VARIOUS SOURCES

Source	*Type of water*	*No. of samples*	*Determinations*
CentralWater Authority	borehole	3	pH, acidity, Ca, Mg.
Ministry of Fisheries ...	Cameron Hatchery	2	pH, alkalinity, hardness, Na, Cl.
Baie du Cap Estate	Spring water	1	pH, Na, Cl.
Baie du Cap Estate ...	Spring water	1	Na, K, Ca, Mg, Cl.
Baie du Cap Estate ...	Cave water	1	Suitability for irrigation
Cernol Chemicals Ltd. ...	Industrial	2	Oil traces, Cl.
Food &Allied Ltd. ...	Industrial	1	Dissolved oxygen, Ca, Mg.
Floreal Knitwear Ltd. ...	Industrial	2	Dissolved and suspended (solids)
Mauritius Meat Authority	La Ferme Sewage plant	1	Suitability for irrigation

MISCELLANEOUS ANALYSES

10.3.8. Some odd samples from the private sector were also analysed and the results are shown in table VIII.

TABLE VIII

ANALYSIS OF VARIOUS SAMPLES

Samples	*No. of samples*	*Determinations*
Dipping bath ...	4	As_2O_3
Iron rust ...	1	Fe_2O_3
Boiler Scales ...	2	Fe, Ca, Mg, PO_4
Crude Glycerine ...	1	glycerol

L. C. Lam Thuon Mine, Scientific Officer

N. N. Ramanjooloo, Scientific officer

FOLIAR DIAGNOSIS

10.4.1. The Division started regular foliar diagnosis as from January, 1976. Tea leaves were analysed from January to June. Work was disturbed in July due to the Division's participation in Expo 1976. In August, analysis of sugarcane leaves was started and completed in November. Afterwards the work on tea leaves was resumed.

NOTES ON THE METHODS EMPLOYED

10.4.2. The technique of aluminium block mass digestion proved to be extremely advantageous in such determinations where a large number of samples had to be analysed. 36 leaf samples could be mineralised within 3 hours. Only one mineralisation of an individual sample was necessary for the determination of all the three main leaf nutrients NPK.

The technique has the following additional avantages over the classical Kjeldahl digestion.

(i) The apparatus is simple and not costly. Only pyrex boiling tubes are needed.

(ii) The quantity of each sample required for mineralisation is very small — around 100 mg being used.

(iii) Digestion of a sample can easily be replicated, if need be.

(iv) Economy of Chemicals — mineralisation of each sample requires only a few millilitres of sulphuric and perchloric acids. Furthermore, since small aliquots of the resulting solution are used, the subsequent determination of NPK requires only small quantities of Chemicals.

(v) It produces accurate and reliable results.

(vi) The reagents preparations are easy to make and infre-infrequent.

(vii) On the whole, time is saved considerably.

DETERMINATION OF NITROGEN

10.4.3. A rapid colorimetric method is adopted instead of the relatively time consuming semi-micro distillation using the Markham Unit. The orange-brown coloured complex $NH_2 Hg_2 I_3$ is developed by using Nessler's reagent and the absorbance is measured by the SP 600 visible spectrophotometer.

DETERMINATION OF PHOSPHORUS

10.4.4. The molybdenum blue colour of the reduced phosphomolybdic acid is developed on an aliquot suitably diluted and the absorbance is measured bythe spectrophotometer.

DETERMINATION OF PATASSIUM

10.4.5. An aliquot of the digest properly diluted is passed through the flame photometer without any further treatment to detremine the concentration of potassium.

SUGARCANE LEAVES

10.4.6. From mid-February to the beginning of April, 1976, the Extension Division sent 152 leaf samples to be analysed for NPK. The object of the experiment was to assess the nutrient status of soil. These leaf samples constituted the C series, i.e. leaves from holding size between 5 and 20 arpents. A summary of the results is presented in table IX and illustrated by Fig. I, II and III.

TABLE IX

RESULTS OF NPK IN SUGARCANE LEAVES ON A DRY MATTER BASIS (D.M.)

% Nitrogen (D.M.)	*Frequency*	*% Phosphorus (D.M.)*	*Frequency*	*% Potassium (D.M.)*	*Frequency*
1 and under 1.5	8	0.15 and under 0.19	12	0.65 and under 0.76	1
1.5 and under 1.9	19	0.19 and under 0.22	59	0.76 and under 0.86	9
1.9 and under 2.3	31	0.22 and under 0.25	60	0.86 and under 0.96	16
2.3 and under 2.7	53	0.25 and under 0.28	13	0.96 and under 1.06	21
2.7 and under 3.1	32	0.28 and under 0.31	6	1.06 and under 1.16	31
3.1 and under 3.5	9	0.31 and under 0.34	2	1.16 and under 1.26	41
				1.26 and under 1.36	17
				1.36 and under 1.46	11
				1.46 and under 1.56	5

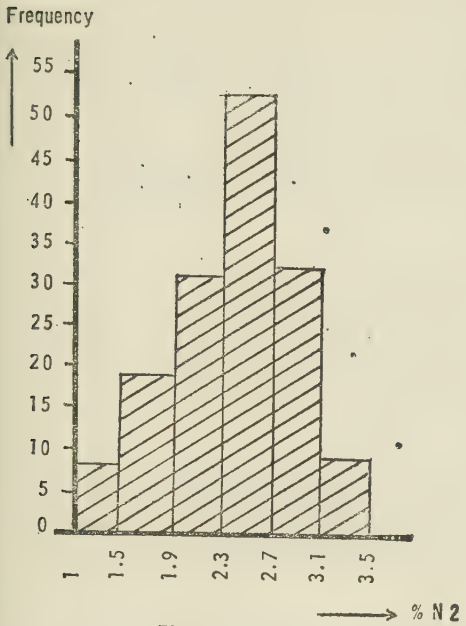


Figure 1

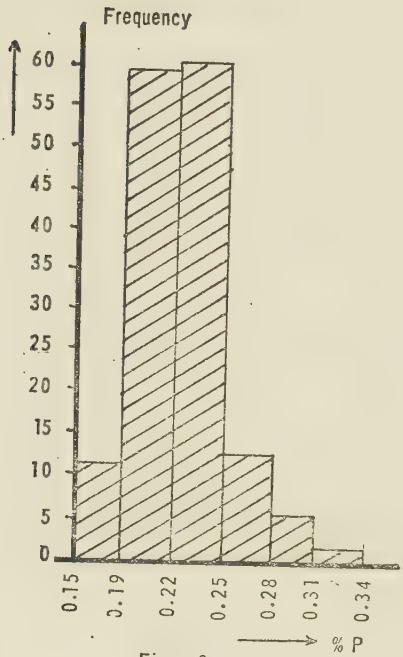


Figure 2

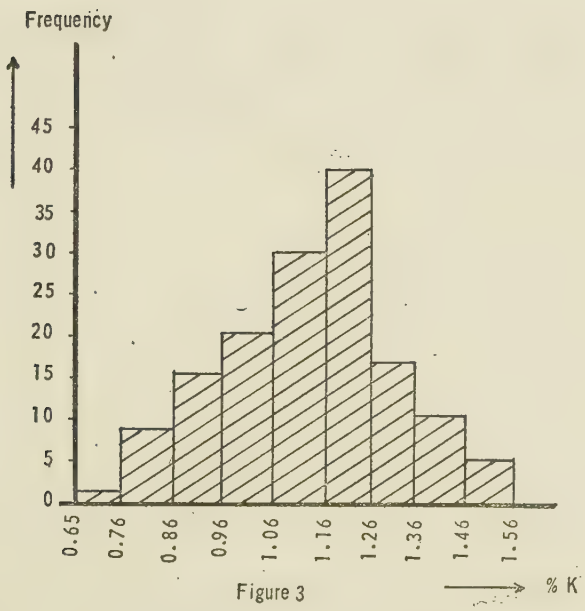


Figure 3

The average NPK values of the sugarcane samples can therefore be concluded as follows:—

Modal nitrogen content is between 2.3 and 2.7%

Modal phosphorus content is between 0.22 and 0.25%

Modal potassium content is between 1.16 and 1.26%

TEA LEAVES

10.4.7. Tea shoots plucked at Wooton Experimental Station are separated into first, second and third leaf on reaching the laboratory. The , first leaf ' for the purpose of analysis means the bud and the first leaf. Leaves, either mature or young, should not be taken from dormant (Banjhi) shoots for analysis.

10.4.8. The separated leaves are dried ina forced air oven at 105°C overnight. The dried samples are crushed by hand and a sub-sample ground in an intermediate Wiley mill to pass through a 40 mesh stainless steel sieve. The ground samples are kept in closed polythene bags until analysis can be performed. But it is necessary to re-dry the powder and cool in a desiccator just prior to analysis.

10.4.9. Mineralisation of the leaf samples is the same as outlined for sugarcane leaves analysis.

10.4.10. The methods of determination of NPK are exactly as outlined for sugarcane leaves. The dilution factors have however to be different as the percentages of NPK in tea leaves are greater than those in sugarcane leaves.

10.4.11. In connection with experiment 3 (Agr/15A/V/71–76) set up by the Agricultural Division at Wooton Tea Experiment Station, 60 leaf samples (first, second and third leaf) were collected for the determination of NPK. The experiment which was started in 1971 has as objective the determination of the optimum rate of nitrogen application in relation to yield and the point at which economic responce for higher doses of nitrognen is available. The experiment is due to end in June, 1977. The results of N and P are summarized in table X.

TABLE X

RESULTS OF N AND P IN TEA LEAVES ON A DRY MATTER BASIS (D.M,)

	% Nitrogen (D.M.)		*% Phosphorus (D.M.)*	
Sample	*Range*	*Median*	*Range*	*Median*
1st leaf ...	4.60 — 5.05	4.80	0.46 — 0.51	0.48
n2d leaf ...	3.93 — 4.26	4.05	0.38 — 0.41	0.39
3rd leaf ...	3.35 — 3.50	3.46	0.31 — 0.34	0.33

Potassium shows no variance in relation to the position of the leaf in the pluckable shoot. Most of the values lie between 1.63 and 1.71% with a median value of 1.68% on a dry matter basis.

10.4.12. In connection with the experiment 4A (Agr/15D/1/76) started by the Agruicltural Division at Wooton Tea Experiment Station in October 1976, leaves are being collected monthly for analysis. The object of the experiment is to study the response to phosphorus (Triple Superphosphate) by tea planted in the presence of different mulchings such as bagasse, sawdust, tea waste and dry litter coming from prunning. This experiment which has been scheduled to last over a period of 6 years requires the following determinations on a monthly basis.

(i) Variation of the soil pH.

(ii) Phosphorus content in bud and first leaf and in the third leaf.

(iii) Available phosphorus in the top 4-inch soil.

The idea of the analysis is to find the amount of phosphorus taken up by the leaf and the soil.

Two batches of 20 leaf samples have been collected for the determination of phosphorus. 40 samples of soil have also been collected and analysed for pH and available phosphorus — see under soil section *(b)*.

10.4.13. Concurrently with the work being done on tea leaves in connection with the fertiliser trials, a small leaf analysis survey is being carried out. Regular samples of leaves have been taken from Field 3 at Wooton Experiment Station as from the end of January 1976. Leaves coming from this field, which representative of the whole station, represent the conditions of healthy and high yielding tea. Analysis of these leaves will provide a general idea of the leaf nutrient levels to be expected throughout the year in healthy tea in Mauritius and at the same time a basis for comparison in the interpretation of results of analyses of unhealthy or low yielding tea.

72 leaf samples have been collected throughout the year. These have been processed and kept for analysis. Work on these leaves is expected to start early next year. In order to obtain conclusive results, leaves from this field will have to be collected for 3 or 4 years. Efforts will be made to establish the levels of the major nutrients in the first, second and third leaves as they vary with agro-climatic conditions.

EQUIPMENT FOR MINOR ELEMENTS IN TEA

10.4,14. The SP 1900 atomic absorption spectrophotometer for the detection of minor elements in tea leaves is still out of order after Pye Unicam engineer's visit in September, 1976. The exit slit unit and wavelength gearbox assembly were damaged and could not be repaired until new parts would be received. Tea Development Authority has been requested to claim the spare parts from Pye Unicam and arrange for another engineer's visit.

CHEMICAL PROCESSING UNIT

10.4.15. The AC 60 Chemical Processing Unit for processing tea samples for the determination of N and P has been set up and is ready for use when the new laboratory starts functioning.

A. H. Mohungoo, Scientific Officer

FEEDS AND FODDER

10.5.1. Raw materials for the manufacture of animal feeds were analysed for one or more of the following: — fibre, protein, fat and fluorine in order to establish the correct formulation. Afterwards the prepared feeds were checked for their standards.

10.5.2. Local maize and molasses were regularly collected from Richelieu Feed Factory for the determination of moisture and degree brix respectively.

10.5.3. The Animal Production Division started an experiment on scum at Mon Desert Alma in September, 1975. The objective was to determine the variation of protein and fibre contents where a specimen of scum was allowed to decompose in the open air.

Two samples of scum, one from the top layer and the other from the middle one, were collected weekly for the determination of protein and fibre. It was observed that the protein of the top layer rose from 12.9% in September to attain an average of 22.3% in March, 1976 and afterwards remained almost the same up to December 1976. On the other hand the fibre content decreased from 19.8% to 14.1% throughout the experiment. It can be concluded that the protein content has almost doubled while the fibre content showed a slight decrease.

For the middle layer, the protein did not show any appreciable change as it rose from 16.4% to 18.0%, and the fibre content decreaced from 23.4% to 16.3%. The results were expressed on a dry matter basis.

10.5.4. Silage samples from Animal Production Division necessitated regular check to investigate their stability characteristics with different additives such as urea, ammonia and molasses. Analysis on fresh and 30–day old silage gave the results which are presented in table XI.

TABLE XI

RESULTS OF FRESH AND 30»DAY OLD SILAGE

Sample	*Fresh Silage*			*30-day old Silage*		
	% D.M.	*Brix*	*pH*	*% D.M.*	*Brix*	*pH*
Cane tops	68.1	15.9	5.0	25.4	10.2	4.3
Cane tops + Ammonia + Molasses ...	62.9	21.1	8.5	30.3	17.5	4.5
Cane tops + urea	64.7	18.1	5.6	27.8	15.9	4.8
Cane tops + urea + molasses ...	34.1	19.9	6.2	28.8	15.9	4.5
Cane tops + urea + ammonia + molasses	37.5	21.1	7.8	29.9	17.6	4.5

10.5.5. The elimination of the soluble carbohydrates by bacteria with the formation of fatty acids has brought down the brix degree and pH.

10.5.6. Method of the determination of urea nitrogen was studied and the level of urea in a contaminated sample of molasses from Animal Production Division was successfully determined.

10.5.7. The experiment on sugarcane as a potential source of animal feed is still in progress. The objective is to investigate the effects of:

(i) cutting interval

(ii) planting date

(iii) plant population of N fertilization on the total yield of sugarcane. After each cut, samples of sugarcane tops and stalks were received for the determination of dry matter, protein andfibre.

10.5.8. In connection with the experiment set up by the Agricultural Division at Curepipe Experiment Station ion the suitability of 8 grass species as a source of fodder, samples of grass were received after each cut and analysed for dry matter, fibre and protein. As the number of samples has incresaed considerably the aluminium block mass digestion technique has been adopted for the determination of protein.

10.5.9. New varieties of sweet potatoes from China were introduced by the Chinese Agricultural team. Their vines which are recognised as a source of fodder for livestock were analysed. The results are given in table XII in terms of percentage on a dry matter basis.

TABLE XII

RESULTS OF ANALYSIS OF DIFFERENT VARIETIES OF VINES

Varieties	*% D.M.*	*% Protein*	*% Fibre*	*% Ether Extract*	*% Ash*
Leek	12.0	7.5	20.0	2.5	13.7
Little Leaf ...	12.1	8.0	25.0	2.5	13.5
Chowning ...	10.1	10.3	21.6	2.4	13.7
Peking	11.1	8.8	20.8	2.3	15.7
Chestnut ...	13.3	6.7	23.4	2.0	13.7
White Starch ...	14.7	8.1	19.0	2.0	14.2
Chain	10.4	10.7	23.0	2.9	16.0
Yue	11.8	8.1	21.5	2.6	14.7

10.5.10. The Agricultural Division completed the experiment on soil regeneration at Curepipe Experiment Station. The aim was to compare the effect of silica from Calcium Silicate Slag and basalt dust on setaria. The last cut of the setaria was analysed for dry matter, fibre, protein and silica. It was was concluded that there was no significant different between the control and the treated ones.

MISCELLANEOUS ANALYSES

10.5.11. Samples of paddy were collected from Ville Bague Rice Milling Industry for the determination of moisture. The price paid by the mill to the planters was according to the moisture content of the paddy.

10.5.12. A few odd samples of feeds from private sectors were also anlysed.

L. C. Lam Thuon Mine, Scientific Officer

GROUNDNUT CAKES

10.6.1. Groundnut cakes were collected monthly from Livestock Feed Factory and analysed for the presence of aflatoxin. The results obtained indicated no detectable level of aflatoxin except those obtained in july and September 1976 showed a very low level of about 0.02 ppm.

CITRUS GREENING DISEASE *Gentisoyl Glucose*

10.6.2. Some 141 samples of Citrus species from various localities were examined for gentisoyl glucose. It was interesting to note that no greening symptom was detected after tetracycline treatment by the Plant Pathology Division.

PESTICIDE RESIDUES

10.6.3. Samples of water and soil from the Solitude Camaron Project were received through the Ministry of Fisheries. They were analysed for pesticide residues. Aldrin and DDT were detected in the soil samples while no positive results were obtained in the water samples.

10.6.4. One sample of unknown pesticide was analysed for the Agricultural Division, It was identified to be Round-up, a herbicide.

EQUIPMENT FOR PESTICIDE RESIDUE WORK

10.6.5. The F17 Perkin Elmer Gas Chromatograph has been received but there has been a delay in obtaining the flame photometric detector to be connected to it. The Chromatograph will be set up by the Perkin Elmer's engineer as soon as the detector would be received. All the necessary gases for operating the equipment e.g. dry air, hydrogen and , white-spot ' nitrogen have already been obtained.

MISCELLANEOUS

10.6.6. On the recommendation of Dr Pickering of the Tropical Products Institute (TPI), a request has been made through the Ministry of Economic Planning and Development for a TPI Analyst to provide some training for the staff.

10.6.7. The new laboratory will probably be ready by August-September, 1977. About 60% of the construction work was accomplished by December, 1976. Pre-operational activities have been planned so that the laboratory may start operating as soon as possible.

10.6.8. L. C. Lam Thuon Mine has been appointed member of the Pesticide Control Board.

10.7. The following table shows the number of samples analysed for the year 1976:

Samples	*No. of Samples Analysed*
Soil from small planters	149
Soil in connection with various experiments ...	133
Soil from various sources	52
Fertilizers	25
Compost	7
Cattle manure	109 (not yet completed)
Water	14
Sugarcane leaves	152
Tea leaves	172 (72 not yet completed)
Raw materials for the manufacture of feeds ...	11
Prepared feeds	62
Local maize	332
Molasses	81
Scum	94
Silage	20
Urea	1
Sugarcane tops and stalks	336
Grass	348
Sweet potato vines	8
Setaria	20
Paddy	30
Various feeds and fodder	12
Groundnut cakes	36
Citrus species	141
Miscellaneous	14

XI. ANIMAL PRODUCTION DIVISION

Head of Division: C. Delaitre, Divisional Scientific Officer

11.1. The work of the Division centered on reasearch relating to the nutrition and growth of cattle, goats and pigs. In that connection, Dr. R. Preston continued to act as Consultant to the Animal Production Division with special reference to use of sugar cane and sugar cane by products as animal feed.

11.2. The Divisional Scientific Officer continued to be in charge of formulating rations at the Livestock Feed Factory.

11.3. During the year the Divisional Scientific Officer acted as Principal Agricultural Officer on two occasions from 16th July to 1st October 1976 and from 29th November 1976 to 13th December 1976.

Mr Naidoo acted as Officer in charge, Animal Production Division during period (16th July 1976 to 1st October 1976). Mr Hulman returned after having completed the first part of his post graduate studies in U.K. and on 1st October 1976 was transferred from Extension Services Division to Animal Production Division where he acted as Officer in charge. Mr Naidoo being on the same date transferred to the Extensionn Services Division.

11.4. The Divisional Scientific Officer (Animal Production) proceeded on Mission to New Zealand (February 20th to 6th March), accompanied by Officer in charge Animal Health Division (Mr Beeharry) to select heifers which were to be donated to the Government of Mauritius by the UNDP/FAO Agency. He also attended an International Conference on the utilisation of sugar cane and its by products for milk and meat production at the " Centre de Investigation Y Experimentacion Canadera, Chetumal Q.R. Mexico" (6th May — 18th May.)

11.5. He also attended a meeting under the aegis of the Comite de Collaboration Agricole (Maurice — Madagascar — Réunion) in Reunitn Island (13th to 15th December). The meeting dealt mainly with the use of sugar cane and its by products for milk and meat production.

11.6. During 1976 the FAO/UNDP sponsored project milk production and processing was in progress; as part of this project the Government of Mauritius received from the UNDP/FAO Agency a plane load of 270 heifers purchased in New Zealand — only one animal died during the flight. The animals were subsequently placed at Richelieu Feedlot where they have been so far doing very well. Work on the construction of Dairy Feedlots, one at Richelieu Experimental Station and the other one at Palmar Livestock Breeding Station had started and progressed satisfactorily.

11.7. Each feedlot will have two wings; each wing has been so designed as to have 160 cows and 160 calves. Each Dairy Feedlot will eventually be provided with a milking parlour for milking with machines, a silo, maternity and bulls pens, a decantation lagoon for the effluent and adequate machinery *(a)* to chip for direct feeding or for silage making, *(b)* to feed molasses and irrigation pumps and pipes for disposal of the effluent by spraying adjoining fields. The project will have its own Rumen Laboratory. The efficient disposal of the effluent including its use for production of Biogas will also be looked into.

11.8. A central milk treatment and packing plant will be constructed at Richelieu. This plant will have a capacity to treat about twice the expected out-out of milk from the two feedlots (at Richelieu and Palmar) so that the various aspects of purchsing, collecting and treating milk from the small cowkeeper could be investigated.

11.9. As part of this same project Scientifice Officer Mr Hulman has been granted a scholarship and has been undergoing the first part of his training for a M. Phil. degree at Reading University (28th December 1975 to 1st October 1976). Advantage could not be taken of antther scholarship offered within the framework of the project.

11.10. To emphasize in the practical implementation of results of research, the Scientific Officers (Animal Husbandry) are posted to the different Livestock Breeding Stations and advise the Officers in charge of the Breeding Stations on all management problems. Scientific Officer, Mr Ma Poon, is adviser to Curepipe Livestock Breeding Station, Scientific Officer, Mr Boodoo, to Richelieu Livestock Breeding Station and Scientific Officer, Mr Gaya, replacing Mr Naidoo, to Palmar Livestock Breeding Station.

RESEARCH WORK

Scientific Officer, B. Hulman *et. al.*

11.11.1. Mr Hulman returned from study leave on 1st October 1976. Digestibility crates were built for *in vivo* digestibility determination on acacia (*Leucœna leucocephala*). By the end of the year the trial was underway

11.11.2. Assisted by officers of the Richelieu Rehabilitation Centre of the Government Prisons Services, Mr Hulman has had to initiate major changes in the layout of one of the byres at the farm at Richelieu Rehabilitation Centre so that the cattle undergoing experimental treatment could be individually fed. Groundnut cake and acacia (*Leucœna leucocephala*) were compared as protein sources in beef cattle diets based on molasses/urea; also the effect of different levels of accaia on liveweight gain and molasses/urea intake when acacia is used as the sole source of forage and protein. This trial is expected to be completed by end of June 1977.

11.11.3. An experiment to investigate the effects of two levels of feeding on the growth of Anglo Nubian male goats from weaning till the age of 18 months was undertaken.

11.11.4. Two dietary treatments with 4 replicates were compared in a completely randomised design using Anglo Nubian goats which were weaned at the age of 3 months. The trial of a duration of 15 months was carried out at Palmar Livestock Breeding Station.

11.11.5. Treatments were: A. 10 kg fodder and 1 kg cowfeed per 40 kg body weight per day; B. 7 kg fodder and 0.5 kg cowfeed per 40 kg body weight per day.

The goats had full access to a mineral mixture containing equal parts of dicalcium phosphate and common salt. Water was available *ad lib.*

(N.B. The fodder consisted of equal parts of Herbe d'argent (*Ischaemum aristatum*) and herbe bourrique (*Stenotaphrum dimidiatum*) which had an avarage composition of 1.2% crude protein on fresh matter basis and a dry matter content of 25.7%.

The animals were regularly drenched with Nilverm and injected every fortnight when their daily ration was adjusted.

TABLE I

AVERAGE LIVEWEIGHT GAIN OF ANGLO-NUBIAN MALE GOATS ON TREATMENTS A AND B

Treatment	*Goats No.*	*Initial wt. (kg)*	*Final wt. (kg)*	*Total gain (kg)*	*Av. daily gain (kg)*
A	1	13.0	41.6	28.6	0.063
	2	14.2	50.0	35.8	0.079
	3	7.0	34.2	27.2	0.059
	4	11.5	36.2	24.7	0.054
Average ...		11.4	40.5	29.1	0.064 ± .006 *(b)*
B	1	12.5	35.6	23.1	0.051
	2	15.5	38.4	22.9	0.050
	3	12.5	30.0	27.5	0.039
	4	7.5	39.8	32.3	0.071
Average ...		120.	36.0	24.0	0.053 ± .006 *(b)*

11.11.6. The results can be summarised as follows:

In treatment A the goats were allowed 8.5 kg dry matter including 0.64 kg digestible crude protein (calculated) per 100 kg live weight.

In treatment B the goats were allowed 5.5 kg dry matter including 0.38 kg digestible crude protein (calculated). The average daily gain during the whole period 15 months was for treatment A 0.064 ± 0.006 kg and for treatment B 0.053 ± 0.006 kg.

There was no significant ($P<0.05$) difference in growth rate between treatments A and B.

The inference is that a daily ration for goats of 7 kg fodder and 0.5 kg loose cow feed per 40 kg live weight is sufficient for maintenance and growth of goats under local conditions.

Scientific Officer H. Gaya *et. al.*

11.12. Recognising that for future work on goats it is necessary to obtain a normal growth curve of goats under controlled conditions, an experiment was designed to collect information so as to draw a growth rate curve of anglo-nubian goats during their first year of life.

(b) Figures with dofferent typescripts denote significance at 5% level.

11.12.1. Eight anglo-nubian kids, four males and four females were utilised for that experiment conducted at Palmar. During the first 3½ months the kids were left with their dams and werea llowed to suckle *ad lib*; fodder and cowfeed was also available for the kids to nib as they pleased.

11.12.2. The dams were fed as follows:

(a) For the first 5 days after kidding
10 kgs fodder (*Ischæmum aristatum*) per head per day
200 grams cowfeed (18% crude protein mixture).

(b) Subsequently
6 kgs fodder/head/day *Ischaemum aristatum*
(Herbe d'argent)
500 grams cow feed (18% crude protein mixture) per head per day.

(An analysis of a samples of Herbe d'argent as supplied to Pamlar Livestock Breeding Station revealed a dry matter content of 34.4%; the crude protein content on dry matter basis being 4.3% and the crude fibre 34.3%.

11.12.3. The kids were given cowfeed *ad lib*, until they consumed 500 gm/head/day, after which they were kept on that ration till the end of the experiment. Fodder was given *ad lib*, and the kids were weighed every fifteen days.

11.12.4. The results of the trial is graphically represented (Figure A).

11.12.5. The trend of growth for males and females were more or less the same. However females grew at a slightly lower rate.

11.12.6. The average weaning weight of the kids was 14 kg.

11.12.7. The average live weight gain of male and female over the following periods was as followxs:

1. From birth to weaning 3½ months — 0.123 kg/day
2. From weaning to 145 days old — 0.027 kg/day
3. From 145 days to 365 days old — 0.090 kg/day.

SELECTION OF BREEDING PIGS *(Growth Performance)*

11.13.1. Two male piglets and two female piglets of good weaning weight and body conformation had their weight recorded during fortnightly weighings for a period of 24 weeks.

11.13.2. The animals received a pig starter ration (18% crude protein) till they reached the weight of 100 lbs after which they received the pig grower ration (14% crude protein).

11.13.3. Results are summarised in table II.

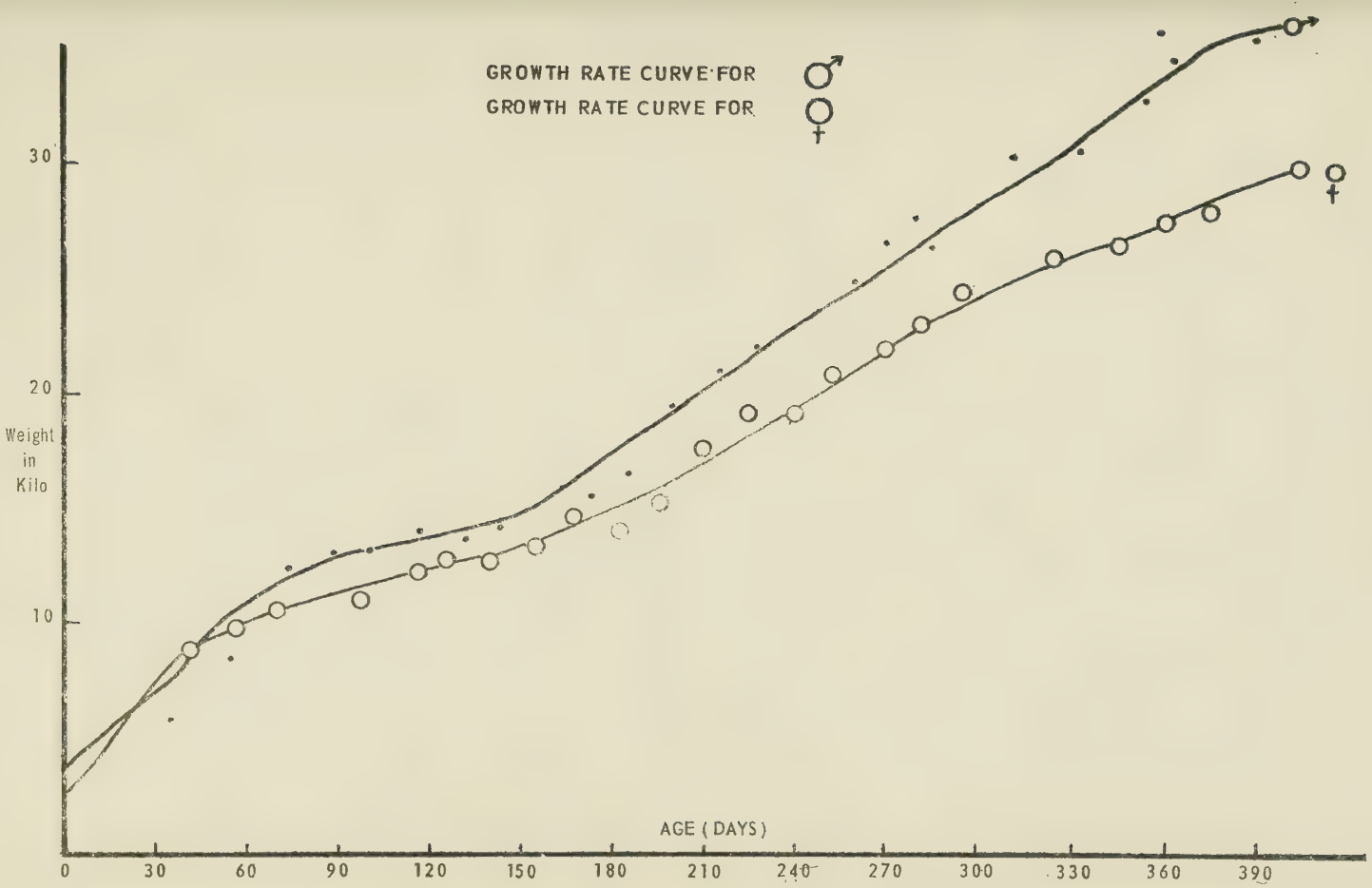

GROWTH RATE CURVE FOR ♂
GROWTH RATE CURVE FOR ♀
30
20
10
Weight in Kilo
AGE (DAYS)
0
30
60
90
120
150
180
210
240
270
300
330
360
390

TABLE II

RESULTS OBTAINED ON PIGS

Tag. No.	*Date of Birth*	*Weaning wt. (kg)*	*Age in days at weaning*	*Weight on 30.12.76 (kg)*	*Age in days on 30.12.76*	*Total gain (kg)*	*Average daily gain (gms)*	*Weight/age*
AAF42 ...	20.5.76	14.5	58	121	224	106.5	641.57	0.540
AAF47 ...	20.5.76	15.25	58	114	224	98.5	593.37	0.509
AAU28 ...	15.5.76	15	58	116	229	101	590.640	0.507
				Weight on 13.10.75 (kg)	Age in days on 13.10.76			
AAU20 ... (died on 20.10.76	15.5.76	18	58	73	115	55	591.40	0.483

Scientific Officer G. Naidoo *et. al.*

11.14. An experiment was designed to find the optimum daily urea level to supplement a standard molasses feeding sustem for growing bulls.

11.14.1. Molasses containing increasing levels of urea were fed to groups of bulls. The results which indicate that increasing the percentage of urea in the molasses beyond 2.5% limits the amont of voluntary intake of the urea, should be viewed with caution because of the inadequate number of suitable animals which could be obtained for the experiment.

STEAM TREATED BAGASSE AS FEED

11.15.1. An experiment was carried out at Palmar Livesrock Breeding Station using steam treated bagasse for fattening of bull calves.

11.15.2. The treatments were the following:

Group I — Steam treated bagasse, urea and molasses mixture, S.T.B.U.M. mixture *ad lib.*

Group II — S.T.B.U.M. mixture *ad lib.* + fish mea 500 gm/head/day

Group III — S.T.B.U.M. mixture *ad lib.* + maize 1 kg/ head/ day

Group IV — S.T.B.U.M. mixture *ad lib.* + maize 1 kg/ head/day + fish meal 500 grams per head day.

The composition of the S.T.B.U.M. mixture was as follows:

Steam treated bagasse	...	90 kg
Molasses	... ...	6 kg
Urea	... ...	1.5 kg
Water	... ...	2.5 kg

The animals did not receive any fodder during the trial which lasted 70 days and the best performance were from the animals of group IV.

Scientific Officer A. Boodoo *et. al.*

ENSILED CHIPPED CANE AS ANIMAL FEED

11.16.1. The voluntary intake of standard silage (chipped cane tops+ 10% molasses) by a group of heifers, weight range (200 — 245 kg) was investigated. The average consumption per head per day was 28 kgs (range 23 — 31 kg).

11.16.2. In one experiment chipped cane tops was ensiled with old scum (for over 3 months) and molasses. Analyses of samples of juice extracted at the start of the experiment could not be done because the scum would clog the pores of the juice extractor so that important information, such as brix, pH, V.F.A. and alcohol content could not be obtained. However, percentage of dry matter, protein and fibre have been obtained and the experiment is still in progress.

11.16.3. In another experiment, an improvement in the quality of chipped cane top silage was tried with ammonia gas incorporated in molasses and added to the chipped cane tops; the objective being:

(1) to provide a cheap source of nitrogen for *(a)* the microorganisms growing in the silage, *(b)* to utilise subsequently the microorganisms of the rumen of animals which consume the silage. (2) A neutralising agent which by raising the pH of the silage in the initial stages of the fermentation will help prevent the growth of yeast and the formation of alcohol.

11.16.4. The following ten treatments were replicated and compared; the silos utilised were 40 gallons polythene-lined drums.

11.16.5. At the beginning of the experiment, after mixing the raw materials, samples were taken for each treatment and analysed for pH, °Brix and dry matter. After a period of ensilling for 33 days the silos were opened and samples taken for each treatment for analyses as above.

TABLE III

TREATMENTS

Data in % by wt.

Treatment	*1 (Control)*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Chipped sugarcane tops ...	100	89	88.5	79	78.5	99.5	92.5	78.5	78.7	78.5
Molasses ...	—	8	8	1	18	—	—	14	16.3	18
Urea	—	1	1	1	1	—	—	—	0.5	1
Water	—	2	2	2	2	—	—	—	1.5	2
Slaked lime ...	—	—	0.5	—	0.5	0.5	—	—	—	—
Fine sand ...	—	—	—	—	—	—	—	—	—	0.5
*Molasses/ammonia	—	—	—	—	—	—	7.5	7.5	3.0	—

*contains molasses 56, water 36 and NH_3 8% (by weight)

TABLE IV

RESULTS

pH, °Brix and dry matter results

Sample	*Start of experiment (fresh)*			*End of experiment (ensile)*		
	pH (juice)	*Brix 20°C (juice)*	*DM (silage)*	*pH (juice)*	*Brix 20°C (juice)*	*DM (silage)*
	Fresh			*Ensiled**		
1 ... (Control)	5.25	8.47	36.25	4.2	6.4	25.2
2 ...	5.50	14.00	33.4	6.1	11.33	28.7
3 ...	8.55	14.12	32.3	6.7	11.04	26.6
4 ...	5.80	19.46	33.2	4.4	16.67	29.7
5 ...	7.65	19.8	27.4	4.5	17.80	32.2
6 ...	7.75	7.43	29.3	5.1	5.32	25.6
7	8.25	12.79	30.5	4.2	11.09	29.0
8 ...	8.25	20.19	31.9	4.0	17.51	30.3
9 ...	7.5	19.29	32.1	4.1	17.64	30.4
10 ...	5.9	18.59	28.1	4.2	16.32	28.9

*Sample 1 — 5 ensiled 34 days
Samples 6 — 10 ensiled 33 days

11.16.6. It was not possible to analyse the various treatments for volatile fatty acids, alcohol and protein content through lack of analytical facilities. However results indicate a superiority in favour of ammoniated molasses in terms of effects on loss of dry matter and brix during the ensiling process. A mixture of urea and ammoniated molasses produced the least loss of dry matter and brix (treatment 9).

11.16.7. It should be mentioned that in practice the personnel handling the addition of ammoniated molasses to the silage suffered from irritation of the nose, eyes and throat, This may limit the practical application of this tceh-nology.

11.16.8. Five treatments of above experiment were repeated during the 1976 crops season.

The treatments were as follows:—

TABLE V

TREATMENTS

	1	*2*	*3*	*4*	*5*
Cane tops% ...	100	92.5	97	92.8	92.8
Molasses% ...				4,2	2
Urea%			1	1	0.5
Water			2	2	1
NH/Molasses† % ...		7.5			3.7

†Molasses 56%, water 36%, anhydrous NH_3 8% by weight.

TABLE VI

RESULTS

TABLE SHOWING QUANTITATIVE LOSS OF DRY MATTER AND °BRIX

Treatments	*DM Loss*	*% Loss*	*°Brix Loss*	*% Loss*
1 (control) (cane only)	42.75	62.8	5.68	35.8
2 NH_3/molasses+cane	32.6	51.8	3.63	17.2
3 Urea+cane	36.9	57.0	2.19	12.1
4 Urea+mol+cane	5.25	15.4	3.97	19.99
5 Cane+mol.+urea+NH_3/mol. ...	7.6	20.3	3.45	16.39

11.16.9. Information on VFA's, lactic acid, alcohol, sucrose and reducing sugars could not be obtained due to lack of analytical facilities. The following were observed:

LOSS OF DRY MATTER

An average of 7/12 as much of the loos in the control occurred when a mixture of urea/molasses or urea/NH_3/molasses was used.

LOSS OF BRIX

One third as much of the loss in the control occured when additives were added, whether molasses, urea or NH_3/molasses.

269 FRIESIAN HEIFERS WERE RECEIVED FROM NEW ZEALAND ON 7th APRIL 1976

11.16.10. A special regime was devised for them and it is here recorded. These animals, a gift from FAO/UNDP agency were flown from Auckland, New Zealand via Colombo to Mauritius. The flight lasted about 24 hours and the animals underwent heavy stress during the trip and showed signs of weakness, on arrival. As for the first consignment their body temperature was somewhat high during the1st week, 103° — 104°F. On arrival at Richelieu they received grass only and when they had eaten sufficient grass they were offered water — subsequently green grass, clean water and minerals were given *ad.lib.* and as from the 3rd day they received 1 kg cow feed/head/day in 5 days. As from the 10th day they were offered high molasses/urea, diet according to a gradually increasing schedule starting with 0.25 kg/head/day of molasses urea +fodder+cow feed and by the end of 4 weeks they were consuming an average 1 kg molasses/urea per head per day.

11.16.11. The animals got accustomed rather easily to molasses/urea and sugar cane feeding. It has been decided that about one quarter of the Friesian heifers will be mated to Sshiwal, one quarter to Friesian, one quarter to Creole, one quarter to Simmenthal.

11.16.12. On 17th October, Sahiwal cattle, which had been received as a gift from the Government of Pakistan in 1974 and kept under quarantine at the " Dog Pound " in Port Louis, were transferred to Richelieu. It was decided to breed from them and collect data pertaining to these animals. Some of the Friesian heifers will be mated with Sahiwal bulls.

11.16.13. By the end of the year the following observations could be made: *(a)* The bulls were shy breeders, *(b)* Cows were relatively low producers of milk, *(c)* The cows would not let down their milk unless their calves were near them and in some cases would let down milk only after the calf had suckled.

Ssientific Officer K. Ma Poon *et. al.*

EFFECT OF UNSATURATED OIL ON MILK PRODUCTION OF COWS FED ON MOLASSES/BAGASSE MIXTURE AND FORAGE

11.17.1. A number of experiments have now been carried out on the development and evaluation of a dairy concentrate replacement mixture based on bagasse pith, molasses, groundnut cake and urea. Previous work has shown that the inclusion of unsaturated oil appeared to give rise to some improvement in the feeding value of molasses/bagasse mixture.

11.17.2. The present experiment was set up to evaluate the use of groundnut oil at the level of 100 gm/day added to the mixture of bagasse/molasses/groundnut and urea.

11.17.3. Four treatments were examined:

(1) Molasses/bagasse mixture as negative control

(2) Molasses/bagasse mixture + 100 gm oil/day

(3) Molasses/bagasse mixture with local fish meal instead of groundnut cake

(4) Standard cereal based cowfeed as positive control.

11.17.4. The design was a random block with 8 replicates, with individual cows on each treatment. A modified change over scheme was used.

11.17.5. The feeding sequence for each cow was:

$S_1 — E — S_2$

S_1 = Standardisation period (cowfeed) for 30 days, 5th to 35th day after calving

S_2 = Standardisation period (cowfeed) for 30 days

E = Experimental period — 46th day to 105th day after calving. Days 36 — 45 and 106 — 115 are for ration changeover.

11.17.6. The concentrate supplements was given at the rate of 500 g/litre of milk produced and the rest of the ration was fresh forage fed *ad. lib.* plus minerals.

11.17.5. The cow were allocated to the trial in replicates according to the time of calving.

11.17.8. The results of the experiment are set out in Table VII. The data show quite clearly that the conventional concentrate feed is superior to any of the molasses/bagasse pith combinations and that although there are some indications of improvement from the inclusion of groundut oil in the mixtures, the effect is not significant. It is particularly noteworthy that maintenance of liveweight is favoured by the conventional concentrate mixture and that the additional oil offers no improvement with respect to this trait in comparison with the basal molasses/bagasse pith mixture.

11.17.9. In can therefore be concluded that there are no economic advantages from the use of unsaturated oil in this molasses/bagasse pith mixture.

TABLE VII

ADDITION OF GROUNDNUT OIL OR FISH MEAL TO A MOLASSES/ BAGASSE/PITH/UREA/GROUNDNUT CAKE FOR MILKING COWS

			Molasses/Bagasse pith/urea			
		Cereal concentrate	*Fish meal*	*Groundnut cake alone*	*Groundnut cake and oil*	*S.E.*
Milk yield, kg/d						
Standard (S_1)	...	12.0	12.1	11.8	9.57	
Experiment (E)	...	11.0	7.27	7.93	6.96	
Standard (S_2)	...	9.25	6.14	7.61	6.63	
Persistency,%	...	104.3^{a}	79.8^{c}	82.0^{bc}	87.1^{b}	± 3.66
Weight gain, kg/d[1]	...	0.212^{a}	0.032^{b}	-0.124^{b}	-0.078^{b}	± .06

[1] In experimental period of 60 days

abc Means without letter in common are significant at $P<0.05$

S_1 — Cereal concentrate days 5 to 35

S_2 — Cereal cencentrate days 115 to 145

E — Experimental ration days 45 to 105

REORGANISATION OF PALMAR LIVESTOCK BREEDING STATION (CATTLE SECTION)

11.18.1. The Chief Agricultural Officer appointed a Committee under the Chairmanship of Scientific Officer, Mr Ma Poon, to look into some management aspects at Palmar L.B.S.

(1) The number of each type of cattle to be kept on the station.

(2) The accomodation requirements.

(3) The feed requirements.

(4) The various feeding systems available.

11.18.2. The Sub-committee produced 3 papers and the recommendations are being implemented. Similar exercise are being undertaken for the other livestock breeding stations.

EQUIPMENT RECEIVED

11.19. During the year the following equipment were received from the UNDP/FAO Agency.

(1) A Riviere Casalis chipper originally designed to harvest and chip maize plants for silage making. Trials elsewhere had shown that it could not harvest and chip sugar cane in the field but worked very well when sugar cane was hand fed to the stationary machine.

(2) A mixer feeder " Gehl " was also received. A modification of its hitching part had to be done and it can now be hitched to any tractor.

VISITS

11.20. Mauritius having achieved a certain reputation in the field of animal production in the tropics based on the use of sugar cane and its by-products for milk and meat production, we were gratified by the visit of eminent scientists and other interested visitors from overseas. Professor Mc Clymont, University of New South Wales; Dotor Owen, University of Reading; Doctor Halpin, Advisor Overseas Development, Agency (U.K.); Doctor Seynave, University of Lille (France); Doctor Z. O. Muller, Scientific Director Asia Research, Singapore; Mr Jensen, Droughtmaster Cattle Society (Australia); Mr B. Atlee, Engineer Mc. Connel Equipment Ltd.; Mr Gilibert, Director Establishment de l'elevage de la Reunion; Mr Stephen, Engineer Alfa Laval a group of International Economists on a post-congress tour to Mauritius and a delegation of cattle breeders from Reunion Island.

GENERAL

11.21. The animal Production Division collaborated with the youth guidance service to prepare a guide for school leavers concerning the scope of the animal production discipline and prospects of employment in this field in Mauritius.

XII. ANIMAL HEALTH DIVISION

Head of Division: M. F. Mosaheb, Principal Veterinary Officer

ARTIFICIAL INSEMINATION AND VETERINARY AID SERVICES

12.1.1. During the year under review the Animal Health Division continued to provide artificial insemination and veterinary aid services to cowkeepers. Apart from the above-mentioned services, the activities of the Division comprise also the following: looking after the health of livestock at all Government stations, carrying out tuberculin tests on herd cattle at Government stations and sugar estates, quarantining both large and small animals, preparations of poultry vaccines and carrying out post mortem examinations and diagnostic works at the Animal Health Laboratory, issuing import permits, veterinary certificates of health for export of live animals and enforcing the Animal Disease Ordinance.

12.1.2. In accordance with policy, both Friesian and Creole semen from bulls at the Artificial Insemination Centre were used for artificial insemination. During the year, the total number of artificial insemination performed amounts to 8,010 out of which 482 were performed on Sundays and public holidays. The average conception rate with both Creole and Friesian semen was 56%.

ANIMAL HEALTH

12.2.1. The animal health picture of the island continued to be unique and no exotic disease was recorded. Infections keratoconjunctivitis present at both Palmar and Richelieu Breeding Stations was brought under control through mass treatment of the affected animals and keeping the fly population low by regular spraying and fogging.

12.2.2. With a view to eradicate Bovine Tuberculosis from cattle at Government stations and at sugar estates, tuberculin tests were carried out on 1,940 animals, out of which 15 reacted to the test, giving a percentage of 0.77. These animals were usually disposed of through slaughter.

12.2.3. 4,930 cases requiring veterinary aid were attended by the field staff of the Division. Of these, 965 were related to mineral deficiencies, 706 to affection of the udder, 757 difficult calvings, 891 to digestive disorders, 145 cyst enucleation, and 1,466 miscellaneous cases, e.g. skin conditions, sore eye, sore foot, injuries, etc.

ANIMAL HEALTH LABORATORY

12.3. During the year the work of the Animal Health Laboratory was concerned with *(a)* general diagnosis and *(b)* vaccine production. A total of 2,724 specimens were submitted to the laboratory which were subjected to pathological, bacteriological, parasitological and haematological examinations. These included live animals, animal carcases, blood, milk, water, faecal samples and skin scrapings and were submitted by Government livestock breeding stations, private owners and Police authorities. Of the above, 1,184 specimens were brought by members of the public, 122 by Government stations, 36 by Police authorities and 726 by commercial poultry farms. In addition, 386 specimens, including raw hides articles, stuffed animals and animal skins were submitted to the laboratory where they were sterilized prior to release.

VACCINE PRODUCTION

12.3.1. The following vaccines were produced at the animal health laboratory:—

Type	*Produced (doses)*	*Sold*
Newcastle disease vaccine (live)	164,450	131,181
Fowl Pox vaccine	316,800	116,087

Further, our vaccinators vaccinated backyard poultry keepers' chicks with 2,285 Newcastle Disease vaccine and 940 Fowl Pox vaccine respectively. In addition, the vaccinators helped small poultry keepers with simple advice on management.

12.3.2. To keep up the disease-free picture of Mauritius, the provisions of the Animal Disease Ordinance were rigidly applied to all imports of livestock, livestock products, pets and cage birds. The quarantine kennels, the catteries, both at Reduit and the Mauritius Society for the Prevention of Cruelty to Animals, Rose Hill, the Poultry Quarantine Unit at Reduit and the Animal Quarantine Station at Roche Bois were maintained. To ensure against the introduction of any diseases through the importation of live bullocks, sheep and goats from Australia, the slaughter of these animals were restricted to the slaughter houses at Roche Bois, Rose Hill and Curepipe which are under the control of fully qualified veterinary surgeons.

LIVESTOCK AND LIVESTOCK PRODUCTS

LIVESTOCK

12.4.1. Under the provisions of the Animal Disease Ordinance, 27 ships and 48 aircrafts carrying livestock, pets and birds were cleared by the staff of of the Veterinary Services and all livestock, whether for slaughter or breeding purposes, birds and pets, were subjected to quarantine at the various quarantine stations. During the year, the following stock were received at the quarantine station at Roche Bois.

Country of origin	*Cattle*	*Sheep*	*Goats*	*Pigs*
Rodrigues ...	573	6916	—	1260
Australia ...	534	1311	410	—
South Africa ...	4	—	—	5

12.4,2. In addition, 22 cage birds from different countries were held in quarantine prior to release to importers. At Reduit and the MSPCA, Rose Hill quarantine kennels, 12 dogs and 5 cats, imported from various countries were held in quarantine for a period of six months from the date of arrival. Further, 13,625 day-old chicks from the United Kingdom, 6,655 from Canada, 7,876 from West Germany, 525 from France and 500 day-old turkeys from the United Kingdom were also imported during the year and held in quarantine at various importers' premises.

LIVESTOCK PRODUCTS

12.5.1. During the year, 2.098 import and 464 landing permits were issued. All frozen meat and meat products landed were subjected to veterinary inspection at various cold storages prior to release for sale. The following table summarises the import of livestock products including frozen meat, offals, by-products of abattoirs and prepared livestock feed:—

Livestock Product	*(Quantity kgs)*
Frozen beef and beef products	1,949,855
Frozen mutton and offals and preparations	959,213
Frozen goat meat and offals	54,096
Frozen pork and pork products	63,843
Frozen poultry	—
Frozen turkeys and ducks	12,359
Livestock feed (poultry, pig, dog, rabbit, hors , pheasant and duck)	10,191,382

SLAUGHTER HOUSE DATA

12.5.2. During the year, 2,483 calves, 1,180 cows (slaughtered on humane and unproductive grounds) and 3,163 bulls of the milch breed were slaughtered, producing 748,779 kgs of beef. In addition, 1,447 heads of herd cattle and 599 bullocks imported from Rodrigues, 26 bullocks from Madagascar and 204 bullocks from Australia produced 268,507 kgs, 3,826 kgs and 41,088 kgs of beef respectively.

12.5.3. Likewise, 10,491 kgs of mutton and 48,169 kgs of goat meat were produced in Mauritius and another 11,515 kgs from 1.022 imported goats and sheep giving a total of 70,175 kgs. 612,501 kgs of pork were produced in the country, including pigs imported from Rodrigues. In these figures, offals and preparations are not included.

12.5.4. The slaughter houses returns revealed the following average carcass weight of imported and local cattle slaughtered during the year.

Local cattle (herd)	... 131 kgs
Local milch cow	... 128 kgs
Local bull of milch breed	... 110 kgs
Calves of milch breed	... 92 kgs
Rodrigues cattle	... 156 kgs
Australian cattle	... 201 kgs
New Zealand cattle	... 155 kgs
Madagascar cattle	... 147 kgs

12.5.5. During the same period, 411 permits were issued for the slaughter of bulls of the milch breed for religious (Eid-El-Adha, Muslim festival) ceremonies.

SLAUGHTER HOUSES CONTROL

12.5.6. From the meat inspection returns, 1 total and 99 partial seizures on account of bovine tuberculosis were reported among 8,272 heads of herd and milch cattle slaughtered during the year, giving 1.2% of tuberculosis.

12.5.7. During the year 14 cases of illegal slaughter (including 3 goats, 2 heifers, 1 cow and 8 bulls of the local milch breed) were examined and certificates issued to the Police. Likewise, 14 cases of alleged cruelty to animals and 14 accident cases were examined and certificates issued to the Police.

ADVISORY SERVICES AND LECTURES

Veterinary Officers of the Division continued to visit large and small livestock breeders for on-the-spot advice. They also lectured to the field staff on artificial insemination and minor clinical cases and lectures were also delivered to the Young Farmers and the Village Development Officers.

STAFF MOVEMENT

12.7.1. The Principal Veterinary Officer was nominated by Government to attend the Director of Veterinary Services Conference of the OUA member states on Animal Health at Algiers, Algeria from 18 to 22 October, 1976.

12.7.2. Veterinary Officer R.C.S. Fokeer on his return from Edinburgh after successfully completing his Diploma in Tropical Veterinary Medicine Course was seconded to the Mauritius Meat Authority.

12.7.3. Two temporary Veterinary Officers, namely V.S. Jugessur and I.L. Prayag, 3 Technical Officers (Livestock) 8 Technical Assistants (Livestock) and 3 Agricultural Assistants, joined the Division. Senior Technical Officer L.R. Pascal, Senior Technical Assistants G. Mathoora and I. Gopaul and 3 Stockmen, M. Boolkah, S. Surju and M. Mootoosamy retired from the Service. The death of Stockmen S. Seenyen was recorded with regret at the Division.

VISITORS

12.8. Dr. B. Halpin, Animal Health Adviser at the United Kingdom Ministry of Overseas Development and Dr. R. Seynave, Director of Abattoir, Lille, France. Visited the Division.

REVENUE

Veterinary fees	...	22,492.40
Sale of vaccines	...	13,457.59
Quarantine fees	...	10,173.00
Advance a/c Dogs	...	4,787.00
Sale of milk	...	8,396.10
Import permits fees	...	2,080.00
Miscellaneous	...	1,304.25
Lease of cows	...	575.45
Sale of drugs	...	11,504.11

XIII. DAIRY CHEMISTRY DIVISION

Head of Division: J. E. Pablot, Divisional Scientific Officer (Dairy)

Officer in charge: P. Mardamootoo, Scientific Officer (from July to 10th December, 1976).

Officer in charge: J. Ng Man Sun, Scientific Officer (from 11th December, 1976).

SURVEY OF MILK QUALITY OF CREOLE COWS

13.1.1. The first phase of the milk survey of the whole island, in which some 400 small cowkeepers are involved, which started on 29th May, 1973 and scheduled to run for three years, ended at the end of May, 1976. The next phase did not follow immediately because the staff of the Division was taken up with the preparation of exhibits for Expo ,76.

13.1.2. The survey resumed on the 19th July and is still continuing. Ten samples of milk were collected in the evening and ten in the morning. The officers reponsible for the collection of the milk samples were two Field Assistants and two Clerical Assistant assisted by Laboratory Attendants of the Dairy Laboratory and the Livestock Attendants of the Pasteurisation Centre of Curepipe Livestock Breeding Station. The samples of milk are purchased from the cowkeepers; the price for one pint of milk was increased as from July, 1976 from forty (40) cents to fifty (50) cents. Two vans are used for the survey and collection of milk samples.

CALCIUM AND PHOSPHORUS IN MILK

13.1.3. In addition to the determination of density, fat, protein, total solids, solids-not-fat, freezing point (hence%water added) coliform and toatl bacteria counts, which had been done throughout the survey, the determination of pH, calcium and phosphorus were also started. The last two determinations involved converting 10 ml portions of milk to ash; with the single muffle furnace available in the laboratory, the calcium and phosphorus contents of only ten milk samples (five evening and the corresponding five morning ones) were determined daily. Those determinations are being carried out by the three Technical Officers.

13.1.4. The average results for the year are as follows:

Density	1.028	Freezing point ...	—0.539°C
Titratable acidity ...	0.17 %	Coliforms/ml ...	1030/ml
Fat%	3.58	Total Bacteria/ml	335×10^3/ml
Protein%	3.05	pH	6.67
Total solids%	12.48	Calcium% ...	0.127 for Nov.
Solids-not-fat% ...	8.90	Phosphorus% ...	0.092 and Dec.

Yoghurt: (Mr. P. Mardamootoo — Scientific Officer
Mr. S. Ramessur — Technical Officer)

13.2.1. Early this year, a programme of work was initiated to prepare yoghurt, to establish the norms for the product and study its keeping quality. This project has now been brought to a successful conclusion and it is now felt that the Dairy Division is in a position to advise the public on the establishment of small scale yoghurt manufacture.

13.2.2. The two bacterial strains used for the manufacture of yoghurt are *lactobacillus bulgaricus* and *streptococcus thermophilus*. In yoghurt of the right acidity the proportion of the two strains is approximately 1 :2 or 1 :1. The following precautions should always be observed:

(i) perfectly fresh milk should be used;

(ii) the greatest cleanliness is essential;

(iii) all utensils should be sterilised before use;

(iv) the milk should be kept covered during heating, cooling and ripening.

13.2.3. A. First Propagation (Preparation of Bulk Starter)

(i) 1 litre of skimmed (or whole) milk is heated at 90–95°C for 30 minutes;

(ii) it is quickly cooled to 40°C;

(iii) the two bacterial strains are added with vigorous stirring;

(iv) the milk is placed in an incubator* or thermostatically controlled water-bath at 40°C;

(v) when the milk has coagulated, which usually takes 12–16 hours, it is placed in cold storage until required.

13.2.4. B. Daily Propagation: Yoghurt (Natural)

(i) 1 litre of skimmed (or whole) milk is heated at 90–95°C for 30 minutes;

(ii) it is quickly cooled to 40°C;

(iii) milk is inoculated with bulk starter at the rate of 2% of the milk to be used while stirring vigorously;

(iv) the milk is placed in an incubator or thermostatically controlled water-bath at 40°C;

(v) when the milk has coagulated, which usually takes 4–5 hours, it is placed in cold storage until required.

13.2.5. During the investigations, the defects of the prepared samples of yoghurt, their causes and remedies were determined and enumerated in the following table.

	Defects	*Causes*	*Remedies*
1.	Wheying off or broken coagulum	Rough handling during incubation	The yoghurt should not be tampered with during incubation
		Low solid-not-fat content	Addition of skim milk powder Addition of 0.1% agar
		Wrong acidities ...	Adjust incubation time to between 5–7 hours
2.	Failure to develop ...	Antibiotics in milk ...	Use milk containing no antibiotics
		Weakened cultures ...	Rejuvenate cultures
3.	Gas formation ...	Contamination with yeasts	Use sterile equipments
4.	Over acidity ...	Too long incubation or use of wrong temperature	Incubate for 5–7 hours at 38°C — 40°C
5.	Failure to develop desired flavour	Imbalance of cultures due to faulty cultures	Use new cultures

*A small cardboard box lined with aluminium foil and warmed with a lighted 60-watt electric bulb can be used as incubator.

13.2.6. The norms for the products were also established. These are the following for natural yoghurt.

Total milk solids ...	...	10 — 11%
Protein ...	...	3.0 — 3.2%
Fat	...	1.6 — 1.8%
Titratable acidity ...	...	0.70 — 0.75%
Total bacterial count	...	10.0 — 70×10^3/ml
Coliform organisms	...	Nil
Keeping quality ...	...	15.0 — 30 days at 8°C

13.2.7. On the opening day of Expo 76, samples of flavoured yoghurt were distributed at the stand of the Dairy Division of the Ministry of Agriculture and Natural Resources and the Environment.

INFANT MILK PROJECT (SCIENTIFIC OFFICER J. NG MAN SUN)

13.3.1. In 1975, about 5 million rupee worth of infant milk was imported in the country. For this reason, the infant milk project was initiated in order to look into the possibility of modifying fresh cow's milk so that the resulting product could fully meet the needs of infants. Human milk contains a higher percentage of lactose (about 7%) than cow's milk (about 4.7%). However, since lactose is a rather expensive sugar, most of the infant milks contain other sugars to make up for the deficiency of the lactose content.

13.3.2. Eight different brands of powdered infant milk were purchased and analysed for fat, protein and sugar content. It was found that the percentages of fat and protein obtained on analysis were in close agreement with the manufacturer's data, as shown in the table below:

Samples	*Fat %*		*Protein %*	
	Theoretical	*Analysis*	*Theoretical*	*Analysis*
1 ...	18.5	18.7	27	26.4
2 ...	10.7—11.7	11.3	19.4—20.4	20.0
3 ...	26.85	26.7	13.75	13.02
4 ...	19.0	19.3	21.6	21.4
5 ...	20.0	19.9	27.7	27.1
6 ...	10.7—11.7	11.3	19.0	19.2
7	27.7	28.7	11.0	12.2
8 ...	28.0	27.7	12.0	12.1

13.3.3. Some difficulties were encountered when it came to determining the percentages of the different sugars present in each sample of powdered milk. Liquid milk was reconstituted from each sample and a serum obtained by precipitating the fat and protein using acid mercury (II) nitrate solution. Then an attempt to separate the sugars from the serum was made using different techniques including that of thin layer chromatography. This was done in collaboration with the Agricultural Chemistry Division. However, the results obtained were not very satisfactory. Work in this direction is still continuing.

CHEESE (TECHNICAL OFFICER S. RAMESSUR)

13.4.1. By the beginning of September a trial experiment on the manufacture of cheddar cheese on a very small scale was started. Pasteurised milk was warmed to 30°C, inoculated with lactic ferment and when the acidity had reached 0.20%, rennet was added to coagulate the milk. The main difficulty encountered in the experiment was the complete removal of whey from the curd obtained. No proper cheese press was available and so the cheese obtained was not of a very good quality. The work has now been temporarily suspended pending arrival of proper equipments for the new Dairy Laboratory.

PASTEURISATION CENTRE, LIVESTOCK BREEDING STATION, CUREPIPE

13.5.1. The staff of the centre comprised one Field Assistant and three Livestock Attendants. They are responsible for the collection, storage, pasteurisation of milk from the Station, and for the maintenance of the Pasteurisation Plant. The pasteurised milk which is sold to the Ministry of Health is collected by a van of the Ministry and distributed to Victoria and Brown Sequard. Hospitals.

13.5.2. 110,251 litres of milk were handled during the year but it is rather unfortunate that 9,078 litres had to be dispatched raw baceuse of breakdowns of the Pasteurisation Plant. Minor repairs were usually carried out by the Divisional Scientific Odfficer and Scientific Officers of the Division but major ones had needed the attention of specialists.—sometimes the technicians of the Ministry of Communications and sometimes those of private firms. The cash receipt for the sale of the milk to the Ministry of Health amounted to Rs 102,889.15.

13.5.3. In order to exercise a close daily control on the quality of the milk, samples of both the incoming raw milk and the out-going pasteurised milk were analysed and the results for a day taken at random were as follows:

	Raw Milk	*Pasteurised Milk*
Density (corrected to 15°C)	30	30
Fat%	3.63	3.53
Proteins%	3.25	3.25
Freezing point ...	—0.560°C	—0.555°C
Total Bacteria/ml ...	116×10^5	82×10^3
Coliform Count/ml ...	10×10^3	Nil
Phosphatase test	—	Negative

COURSES IN DAIRY CHEMISTRY AT THE UNIVERSITY OF MAURITIUS

13.6. Theoretical and practical courses on quality control of milk were given to the students of the University of Mauritius at different times of the year. Visits to the Dairy Laboratory, Reduit and the Pasteurisation Centre, Curepipe were organised.

VISITOR

13.7. In September, a French Expert on Dairy Products working for a private dairy in Quqatre Bornes visited the Dairy Laboratory; he enquired about the chemical and microbiological qualities of milk and the norms of yoghurt in Mauritius.

STAFF MOVEMENT

13.8. At the end of June, 1976, Mr J. Pablot, Divisional Scientific Officer went on overseas leave prior to retirement. Mr P. Mardamootoo, Scientific Officer was then appointed Officer-in-charge of the Division. Miss A. Ah-Yuen, Typist/Stenographer was transferred to the Head Office of the same Ministry and was replaced by Mrs. S. Gopee from the Head Office. Mr G. Aliphon, Field Assistant, left the Division in September and is following a course, sponsored by the Ministry, at the University of Mauritius in view of obtaining a diploma in Agriculture. Mrs. M. Mudhoo and Mr P. Panday joined the Division as Technical Officers in November. Scientific Officer P. Mardamootoo left on study leave on the 11th of December and since then Scientific Officer J. Ng Man Sun is in charge of the Division.

NEW DAIRY LABORATORY

13.9. The construction of a two-storey building started in January, 1976 and will be completed by about July, 1977. The new Dairy Laboratory will occupy the ground floor and will be an extension of the existing Dairy Laboratory.

XIV. CROP EXPERIMENT STATIONS DIVISION

Head of Division: S.Y.E. Doomun, Agricultural Superintendent

INTRODUCTION

14.1.1 The main activities of the Division consisted of the production of vegetable seeds, the propagation of fruit trees and ornamentals and the provision of facilities for carrying out experiments by Scientific Officers of the Ministry. It was also responsible for the maintenance and upkeep of the Royal Botanic Gardens, Pamplemousses, the Government House, Le Reduit, Government House, Port Louis, Headquarters House, Vacoas, Qqatre Bornes D.C.O. and the Central reservation of the Trunk Road. The stations also provided wherever available produce to charitable institutions.

14.1.2. The havoc caused by Cyclone Gervaise which struck in Fedruary 1975 was almost completely repaired. Coconut orchards at Plaisance Experiment Station were reestablished. Other orchards at Barkly Experiment Station and Richelieu Experiment Station were pruned, fertilised and by the end of the year grew well. The Royal Botanic Gardens were restored to their normal state. The Advisory Committee drew up a list of existing plants and a programme was prepared for the introduction and planting of other plant species.

14.1.3. The seed production programme was carried out well above expectations and for the first time in years bean seeds were produced in sufficient quantities to supply the local needs. It was also observed that bean seeds could be produced at Curepipe Experiment Station if plantings started in August. New varieties of carrots were introduced for trial. New vegetables such as Yard Long bean, Bitter Gourd, Sponge Gourd (pipengaille) were released for sale. The cultivation of already well established vegetables was intensified.

14.1.4. The climatic conditions during the year were very fair exception being made of the usually very dry months at the end of the year.

CUREPIPE EXPERIMENT STATION

14.2.1. Officer in Charge: 'Acting' Senior Technical Officer—D. Gya

LOCATION

Latitude : 20° 19'54"

Longitude : 57° 30'30"

Altitude : 1,830 ft.

CLIMATE

14.2.2. The station is situated in the super-humid zone with an average annual rainfall varying between 3,048 m.m. and 4,064 m.m. (i.e. 120 and 160 inches). The number of wet days per annum always exceeds 200.

SOILS

14.2.3. The soils at Curepipe Experiment Station are mostly derived from grey doleretic basalts through the process of laterisation. Soils vary in colour from yellow to reddish brown. They are residual, the original high clay fraction of 70–80 per cent being reduced by leaching to some 40% with a consequent increase in iron concretions. A feature of the soils is that though the clay fraction is high, texture and absorption are good. The fertility is very low. pH varies between 4.5 and 6.0.

WEATHER CONDITIONS

14.2.4. The total rainfall was 3,299.3 m.m. The highest rainfall was during the month of February and the lowest rainfall was during the month of November.

CROPPING PROGRAMME

14.2.5. The programme was implemented and fruits and seeds of the following were sent to Barkly Experiment Station in 1976.

(a) Pumpkin ...	...	3,587 units
(b) Squash ...	...	1,475 units
(c) Bokla ...	...	60 kg
(d) Beans Long Tom	...	212 kg
(e) Cucumber white	...	2,817 units
(f) Calebasse	...	195 units
(g) Pipengaille	...	3,084 units

VEGETABLE FOR SALE

14.2.6. During the year 1976, the following vegetables and fruits were sold to the public. Cucumber, beans, watercress, cabbage, lettuce, peas local, *Solanum nigrum* (brede martin), spinach (epinard), *Brassica sinensis* (petsai), sweet potatoes, carrot, squash, Sponge gourd (pipengaille), Calabash (calebasse), bananas and pineapple.

FODDER

14.2.7. During the year four tons of fodder were supplied to Division of Veterinary Services Reduit daily and on Sundays and public holidays ten tons were supplied to Livestock Breeding Station Curepipe. During cane crop season and during drought, supply of fodder was stopped.

SERICULTURE

14.2.8. The project started in March 1973 and is still going on. Larvae were sent from Reduit. After cocoon formation, cocoons were sent back to Reduit. During the eyear, ten batches of cocoons weighing 35.732 kg were sent to Reduit.

LIVESTOCK

14.2.9.

Muscovite Duckling ...	25
Muscivote ...	63
Pekinese ...	10
Geese ...	17
Black Swan ...	1
Peahen ...	1

EXPERIMENTS BY AGRICULTURAL DIVISION

14.2.10. *(a) Fodder variety trial*

To compare the suitability of eight grass species as a source of fodder. The varieties planted are:—

(1) *Penninsetum Purpureum*
(2) *Cenchrus ciliarus*
(3) *Chloris gayana*
(4) *Panicum maximum*
(5) *Brachearia brizantha*
(6) *Brachiaria ruzizeinsus*
(7) *Tripsacum laxum*
(8) *Setaria sphacelata*

The experiment was set up on 9th January 1974 and is still in progress.

(b) Cucumber — variety trial (Palomar, poinsett, local) — started on 17th February 1975 — completed on 23rd February 1976.

(c) Sweet pepper — observational trial — variety Dhunputh started on 10th January 1976, terminated on 27th March, 1976.

(d) Kikuyu grass — observational trial — started on 18th March 1976 — still going on.

(e) Lentils — Planting date trial — started on 1st April, 1976.

(f) Strawberry — variety trial (Tioga, local, fresno, $\frac{1}{8}$, $\frac{1}{4}$, Cambridge Rearguard.

(g) Lettuce — fertilizer and spacing trial — variety Mignonette. Experiment was started on 8th July 1976 and later repeated on 1st September 1976.

(h) Fodder — observational trial of four species (l'herbe d'argent, Canna rouge, Canna vert, Longe rouge) started on 1st December, 1976.

DISPOSAL OF PRODUCE

14.2.11. Sale of produce 1976 amounted to Rs 9,053.01.

The following organisations received vegetable donations:—

Royal College Curepipe
Canon B. Hagg Quatre Bornes
Parish of St. Patrick Quatre Bornes
Indo Mauritian Catholic Association Port Louis
Tamil League Port Louis
Rev. James Ling Port Louis
Miss Jeanne Lesur Beau Bassin
Rev. P. A. Cathan St. James Cathedral
Dr. P. Sungkur Brown Sequard Hospital
Venerable Ghislain Emmanuel Archdeacon of Mauritius

PLAISANCE EXPERIMENT STATION

Officer in charge: 'Acting' Senior Technical Officer—D. Gya

14.3.1. The station is situated in the South Eastern part of the Island next to Plaisance Airport. The altitude is about 50ft above sea level. The soil is of the Latosolic Reddish Prairie type and the average rainfall in is the region of 1500 m.m. (60 inches) annually.

WEATHER CONDITIONS

14.3.2. The weather was fair. During the months of October and November drought conditions prevailed.

CROPPING PROGRAMME

14.3.3. The coconut orchards were almost completed. Seednuts were received from Malaysia

14.3.4. The following crops were planted:—

Crops	*Field No.*	*Acreage*	*Date Planted*	*Date Harvested*
Groundnuts	10	65 P	5.11.75	9. 3.76; 10. 3.76; 17. 3.76
Groundnuts	9	45 P	6.11.75	17. 3.76 & 18. 3.76
Groundnuts	5	42 P	7.11.75	8. 3.76 & 9. 3.76
Groundnuts	1	20 P	16.11.75	30. 3.76
Groundnuts	10 B	55 P	17.11.75	30. 3.76
Groundnuts	6	50 P	20.11.75	30. 3.76 & 1. 4.76
Groundnuts	12	21 P	5. 1.76	11. 5.76
Groundnuts	11	1A42P	7. 1.76; 9. 1.76; 12. 1.76	13. 5.76 & 17. 5.76
Chillies Chinese Giant ...	6	5 P	17. 3.76	30. 4.76
Chillies Dhunputh ...	6	600 holes	29. 4.76	Plantation uprooted affected by Mosaic and Bacterial wilt
Bokla	6	2850 holes	5. 5.76 6. 5.76	7. 9.76; 15. 9.76 16. 9.76; 21. 9.76; 23. 9.76
Peas local	10	70 P	28. 5.76	1. 9.76; 7. 9.76
Peas local	11	1A30P	4. 6.76	15. 9.76— 17. 9.76 20. 9.76— 22. 9.76
Peas local	12	9,100 sq ft	11. 6.76	24. 9.76; 27. 9.76; 28. 9.76
Peas local	2	39,600 sq ft	22. 6.76	24. 9.76; 27. 9.76; 30. 9.76; 1.10.76; 2.10.76; 4.10.76
Peas local	6	5,900 sq ft	12. 6.76	7. 9.76; 15. 9.76; 24. 9.76; 27. 9.76
Peas local	3	18,000 sq ft	2. 7.76	14.10.76
Bringelle Rosita ...	11	589 holes	3. 9.76	30.11.76; 11.12.76
Bringelle Rosita ...	5	250 holes	11. 9.76	6.12.76 & 11.12.76

EXPERIMENTS CONDUCTED ON THE STATION BY AGRICULTURAL DIVISION

14.3.5. *(a)* Whittet Kikuyu grass — observational trial planted at the beginning of 1976 was harvested on 6th October 1976. The experiment is still in progress.

(b) Onion — variety trial (Californian red, Granix yellow) started on 7th April 1976 and completed on 16th August 1976.

(c) Chillies — variety trial (local Cipaye, Anahein; Long thin cayenne) started on 23rd April completed on 4th December 1976.

(d) Garlic — spacing and fertilizer trial

(e) Bean variety trial (Harvested; Contender; Coco early white; Roquen court, Long Tom; Local red; Victory; Pioneer).

(f) Peas variety trial — (local No. 40; Bonneville, Merveille de Kelvedon).

(g) Onion March Setts — variety trial (Local; California red; Granex yellow).

DISPOSAL OF PRODUCE

14.3.6. The sale of produce amounted to Rs 3,472.13 during 1976. The sum was remitted to Mahebourg Post Office.

14.3.7. The following were sent to Barkly Experiment Station for production of seed and seedlings in 1976:—

(a) Bringelle Rosita	—	708 units
(b) Groundnuts	—	1,988 kg
(c) Peas pods	—	982 kg
(d) Peas decorticated	—	188.5 kg
(e) Pawpaw Wilcox	—	92 units
(f) Pemba coconut	—	317 units
(g) Coconut Malayan Dwarf yellow	—	65 units
(h) Coconut Malayan Dwarf green	—	27 units
(i) Rangpur lime	—	621 units

CENTRAL EXPERIMENT STATION

Officer in charge: Senior Technical Officer — C. Gouges

14.4.1. The station has an effective area of approximately seven hectares, out of which only about three hectares are devoted to vegetable seed production and experiments. It is about 1,020 ft. above sea level. The soil is of the Low Humid Latosols group, Reduit family and is fairly rocky.

DEVELOPMENT

14.4.2. The overhead irrigation system has been repleced by a new one, except for the main 4" diameter pipes. A new electric motor and pump have been acquired and will become operative by the beginning of next year.

The remaining fields which were under fodder were reclaimed as there was no demand for fodder.

WEATHER CONDITIONS

14.4.3. The weather was fair except for a period of drought during the last two months of the year.

CROPPING PROGRAMME

14.4,4. The programme was fully implemented during the beginning of the year but during the second half only a few small plantations was carried out because of lack of rain and because the irrigation pump and motor had broken down.

ORCHARDS

14.4.5.1. Routine maintenance work was carried out and in addition a severe pruning and removal of dead, dying and diseased plants was carried out in the citrus orchard.

14.4.5.2. A poor crop of citrus and avocado was obtained. Except for the mandarins and rangpur lime which were selected and sent to Barkly Experiment Station all the other fruits were sold to the public. 2,264 avocado fruits were harvested and the citrus fruits consisted of the following:—

Oranges	...	...	6,157
Grapefruits	...	...	22,000
Rangpur lime	...	...	6,243
Mandarins	...	...	4,485
Pamplemousses	...	...	258
Tangelo	...	...	665
Vangasailles	...	...	16,865

In addition 18 fruits of Trifoliata Orange were collected and sent to Barkly Experiment Station.

FOOD CROPS

MANIOC

14.4.7. In July the collection of 20 varieties namely:—

Butter stick, Paloma, Yeyein, Rodney, De table, Icery, Nestor Negrita 15, Negrita 17, Bitter, Blanchite, Desvaux, De table St. Martin, Australia, Manioc 29, Manioc blanc, Jaune Rempart, Cassava Beureum, Singapore and Jaune Trianon planted over an area of 0.68 arpent was harvested and yield amounted to 1,092 kg.

The 20 varieties and variety Bourbon blanc obtained from Pamplemousses Experiment Station was planted over an area of 2,750 m^2 in August.

SWEET POTATO

14.4.8. In addition to the existing collection of local varieties, the undermentioned varieties obtained from the Chinese Agricultural Team were planted for observation:

(1) Kwong Tung 16
(2) Chow Nung 69–219
(3) Leek
(4) Peking
(5) Little leaf
(6) Chain
(7) White stozeh
(7) Chesnut
(8) Yue 70–9

GROUNDNUT

14.4.9. About 5,400 m^2 was put under the local variety Cabri for seed production. Last year plantation of approximately 4,200 m^2 yielded only 593.5 kg due to lack of water.

VEGETABLE SEED PRODUCTION

14.4.10. The undermentioned crops were planted for seed production.

1. Squash variety Golden Custard
2. Brede de Chine variety Ham Choy
3. Garlic — varieties Feng Shan Sel No. 1 and Pooning were planted for multiplication at request of the Agricultural Division.
4. Cabbage variety local
5. Beetroot variety local
6. Turnip (Rave blanche)
7. Coriander
8. Cucumber white
9. Brinjal or Eggplant (Bringelle) variety Rosita
10. Sweet pepper variety Dunputh
11. Pipengaille variety local
12. Strawberry — variety Toney, Cambridge favourite, Cambridge rigour, Tioga and Red gauntlet were planted for multiplication purposes at request of the Agricultural Division.

FODDER

14.4.11. The grass collection was maintained as usual and a plot was planted with Whittet Kikuyu at request of the Agricultural Division.

EXPERIMENTS

14.4.12. The following experiments were carried out by the Agricultural Division during the year:—

(a) Strawberry (i) Planting date trial
(ii) Mulching trial
(iii) Comparison of yield of six varieties

(b) Papaya variety evaluation

(c) Garlic variety Feng Shan Sel No. 1
(i) Determination of optimum time of planting
(ii) Variety trial consisting of four varieties namely:— Feng Shan Sel No. 1, Feng Shan Sel No. 2, Pooning and Rodrigues.

DISPOSAL OF PRODUCE

14.4.13. *(a)* The following were sent to Barkly Experiment Station for seed production.

Groundnut variety local Cabri	593.5 kg
Sponge Gourd (pipengailles) variety local ...	66.1 kg (dry fruits)
Squash variety Golden Custard ...	1,417 units
Sweet pepper variety Dhunputh ...	1,876 ripe fruits
Turnip (Rave blanche)	650.950 kg (unclean seeds)
Acacia variety Guatemala	8.500 kg (clean seeds)
Garlic variety Feng Shan Sel No. 1 ...	77.625 kg
Garlic variety Feng Shan Sel No. 2 ...	9.625 kg
Garlic variety Pooning	8.400 kg
Garlic variety Rodrigues	10.800 kg
Coriander	23.00 kg (unclean seeds)
Brede de Chine variety Ham Choy ...	7.200 kg (unclean seeds)
Cabbage variety local	116.500 kg (unclean seeds)
Beetroot variety Local	2.000 kg (selected unclean seeds) 46.000 kg (unclean seeds)
Eggplant (Bringelle variety Rosita) ...	172 ripe fruits
Cucumber variety Local	639 ripe fruits
Sponge gourd (pipengailles) variety Local ...	66.100 kg (dry fruits)
Mandarins variety Fagan	143 fruits
Mandarins variety local round	412 fruits
Mandarins variety local flat	1,580 fruits
Mandarins variety Garoet	132 fruits
Mandarins variety D. K. Poenten ...	140 fruits
Mandarins variety Empress	337 fruits
Rangpur lime	405 fruits
Trifoliata orange	18 fruits

(b) To Abercrombie Nursery

Coffee variety Arabica K7–169/66 — 3 kg ripe cherries.

14.4.14. The sale of produce during the year amounted to Rs 7,940.30.

14.4.15. Vegetables and fruits for the value of Rs 125.00 was given free to several institutions for their fancy fairs.

BARKLY EXPERIMENT STATION

Officer in charge: Senior Technical Officer — L.C. M. Li Ting Wai

GENERAL

14.5.1. Barkly Experiment Station is situated at an altitiude of 740 ft. above sea level in altitude 20° 13.3' and longtitued 57° 27.2' and has an average rainfall of 1061 mm. per annum. The soil is shallow and rocky and is of the Latosolic Reddish Prairie group.

DEVELOPMENT

14.5.2. The fencing of the nursery area was completed.

WEATHER CONDITIONS

14.5.3. The total rainfall recorded during the year 1976 amounted to 960.49 m.m as compared to 1061 m.m average normal. The highest rainfall was obtained in February with 244.45 mm. (average normal 143 mm.).

CROPPING PROGRAMME

PLANT PROPAGATION

14.5.4.1. 15,326 plants of various species of fruit trees and 31,520 units of various ornamental plants were produced and issued to the sales section and to other stations. In addition 68,624 soil blocks (for seed production and experiments) were issued to various stations.

SEED PRODUCTION

14.5.4.2. The seed production programme for 1976 was carried out as outlined below.

Crops	*Acreage planted*	*Remarks*
Rave	6000 m^2	all stecklings obtained with 6000 m^2
Radish	63 m^2	
Chillies variety Chinese giant	3350 m^2	
Brede de Chine variety Baton blanc ...	390 m^2	
Salsify	50 m^2	
Cotomili	8400 m^2	
Rave stecklings	2100 m^2	
Peas greenfeast	1500 m^2	
Peas chinese	4500 m^2	
Peas local	2.93 hectares	
Cauliflower	1560 m^2	
Lettuce mignonette	460 m^2	
Squash golden custard	1500 m^2	
Brede martin	2100 m^2	

Crops	*Acreage planted*	*Remarks*
Petsai	900 m^2	
Beans long tom	2.25 hectare	
Bean Pioneer	2700 m^2	
Bean local red	2800 m^2	
Cucumber white	9500 m^2	
Chillies cipaye	320 m^2	
Brinjal cipaye narain	1290 m^2	
Brede Kotachee	5800 m^2	
Yard long bean	320 m^2	
Margoze CATT	190 m^2	
Pipengaille CATT	410 m^2	
Lalo	1690 m^2	
Groundnuts	2.34 hectare	

14.5.4.3. The foolowing were also planted in small quantities for seed production. Bitter Gourd (Margoze local), Carrot variety Nantes, Pipengaille local, Brede Pallack, Brede de Chine Frisee, Lettuce varieties Iceberg, Blonde d'ete and Reine des Glaces, Asparagus bean, Beetroot, Chillies variety Dhunputh, Beans Victory.

EXPERIMENTS

14.5.5. The following experiments were carried out during the year:—

(a) By Scientific Officers of the Agricultural Division:

1. A variety trial with eight varieties of onion.

2. An observation and multiplication trial with garlic variety Feng Shan Sel No. 1

(b) Plant Pathology Division:—

1. An observation trial with two varieties of beans, two varieties of peas and one variety of soya bean.

MANIPULATION SECTION

14.5.6. After processing 22,196.387 kgs of various seeds (beans, rice, peas, groundnuts, brede, lettuce, rave, squadsh, pumpkin etc.) were issued to seed stores. 6, 9190 units and 21.740 kgs of seeds (ornamentals and fruits) were issued to Nursery section for propagation. 8,678.00 kgs of seeds (pulses) 2,138 grapefruits and 3.000 leek bulbils which were unsuitable for seed production were sent to the sales section. Also 12,446 units and 789.733 kgs of seeds were given to different stations for propagation and milling (rice).

DISPOSAL OF PRODUCE

14.5.7. (i) Items issued free to other stations and Government Institutions:

Plants	...	3,499 units	Rs 2,616.00
Seeds		8,967.690 kgs	Rs 18,812.64
			Rs 21,428.64

(ii) Items sold

Plants	...	36,321 units	Rs 21,269.00
Seeds	...	11,482.048 kgs	Rs 64,502.65
Bulletins			Rs 43.00
Produce from crops			Rs 17,343.48
			Rs 103,158.13

(iii) In addition, seeds worth Rs 1,546.55 were issued to the Ministry of Cooperatives and to the Development Works Corporation.

VISIT

14.5.8. The Ugandan Minister of Agriculture accompanied by the Chief Agricultural Officer visited the station at the beginning of July 1976.

PAMPLEMOUSSES EXPERIMENT STATION

Officer in charge: Senior Technical Officer — F. Lam Kee

LOCATION

14.6.1.	Latitude	...	20° 06.3
	Longgitude	...	57° 34.2
	Altitude	...	230 feet

SOIL TYPE

14.6.2. Low Humic Latosols (Reduit family). Fairly free from rocks and fairly flat land.

ACREAGE

14.6.3. Approximately 10 acres

CLIMATE

14.6.4. Annual rainfall around 50 inches, most of which falls between December and April — cool dry winter and wet hot summer.

WEATHER CONDITIONS

14.6.5. Rainfall registered for the year was 1,612.3 m.m. or 62.48 inches, which was approximately 10 inches above the average normal for the year.

CROPPING PROGRAMME

14.6.6.1. The following crops had been planted during the year:—

Maize local; Groundnuts Cabri; Asparagus; Mulberry; Chillies Chinese Giant; Cauliflower; Tobacco; Rave Blanche; Peas local; Beans; Lettuce and Watermelon. Groundnuts planted for seed production suffered from Rust and yields were low. Watermelon Crimson Sweet had to be discarded for seed production because fruits obtained were small and too uneven in shape. The tobacco plantations this year again suffered from Bacterial Wilt and yields were poor. The other crops grew satisfactorily.

14.6.6.2. For three acres, 5,708 kgs of green tobacco leaves had been harvested and 665.4 kg of cured leaf has been sent to the Tobacco Board. Average price of cured leaf per kilo was Rs 11.96.

EXPERIMENTS

I. By Scientific Officer of the Agricultural Division

- *(a) Tobacco*: Breeding.
- *(a) Brinjals*: Variety trial
- *(c) Okra*:
  - (i) Variety trial
  - (ii) Spacing/Nitrogen trial
- *(d) Soya beans*:
  - (i) One variety trial in March 1976
  - (ii) One variety trial in October 1976
- *(e) Beans*:
  - (i) Variety trial
  - (ii) Spacing trial

II. By Plant Pathology Division

- *(a) Ginger*:
  Chemical control of Ginger blight trial
- *(b) Potatoes, tobacco etc*:
  One rotational trial involving the following crops:—
  Potato, Bean, Groundniut, Ginger, Tomato and Tobacco.
- *(c) Beans*:
  Trial on the control of Beans Halo Blight.
- *(d) Tobacco and Tomato*:
  Tobacco/Tomato bacterial wilt resistance trial on three varieties of tobacco and three varieties of tomatoes.
- *(e) Pulses*:
  Observational plots on the diseases of pulses.

DISPOSAL OF PRODUCE

14.6.8. Sent to Abercrombie Nursery 9,266 potted plants for sale.
Sent to Barkly Experiment Station 8,000 potted plants for sale.
Sent to Quatre Bornes Demonstration Centre and Orchard:158 potted plants for sale.
Sent to Central Experiment Station and Trunk Road: 232 potted plants for planting.
Sent to Richelieu Experiment Station: 9 fruit trees for planting.
Sent to Le Reduit Grounds: 36 potted for planting.
Sent to the Pamplemousses Gardens: 9,400 kilos of Seteria grass and Acacia as fodder for the stags.

SENT TO BARKLY EXPERIMENT STATION AS SEED

14.6.8.1.	Groundnuts Cabri ...	1,522.0 kg
	Rave Blanche	125.5 kg (rough clean)
	Lettuce	6.5 kg (rough clean)
	Beans Long Tom ...	560.5 kg
	Beans Pioneer	414.0 kg
	Peas Local	353.0 kg
	Soya Beans	227.3 kg
	Tomatoes	6.2 kg

SENT TO LIVESTOCK FEED FACTORY

14.6.8.2. 4,009 kilos of local maize had been sent to the livestock Feed Factory to be turned into animal feed concentrates.

SALES

14.6.8.3. Coconut hearts 2 units; Brinjals 76.0 kg; Lalo 1,067.75 kg; Asparagus 8.0 kg; Sweet Pepper 7 units; Beans (Pulse) 18.0 kg; Mascarena revaughanii seeds 100 units; Citron Assam fruits 17 units; Pamplemousses fruit 1 unit; Tomatoes 46.75 kg; Lettuce Mignonette (culled) 292 units; Cauliflower 127 units; Bananas (green) 527 units; Ginger 1,891.5 kg; Coconuts (culled) 137 units; Beans (green) 181.75 kg; Haricot Pale 64.0 kg; Groundnuts Shulamit 27.0 kg; Sweet Potatoes 14.5 kg; Maize cobs 367 units; Dypsis madagascariensis seeds 0.5 kg; Watermelon 140.5 kg; Jack fruit 1 unit; Mangoes (green) 10 units; Tobacco (fluecured) 665.4 kg; , A guide to the Gardens' Booklets 964 copies.

Total revenue collected for the year was Rs 16,731.86

Total revenue collected for tobacco was Rs 7, 962.46

ROYAL BOTANIC GARDENS — PAMPLEMOUSSES

Officer in charge: Senior Technical Officer — F. Lam Kee

LOCATION

14.7.1.	Latitude ...	20° 06.3"
	Longgitude ...	57° 34.2"
	Altitude ...	230 feet

SOIL TYPE

14.7.2. Low Humic Latosols (Reduit family)

ACREAGE

14.7.3. Approximately 67 acres

CLIMATE

14.7.4. Annual rainfall is around 1250 mm. (50 inches); most of which falls between December and April; cool-dry winter and wet-hot summer.

DEVELOPMENT

14.7.5. Replacement of the fence around the stag pen with new chain link fencing was done. Lawns were levelled and grass was planted where necessary. Canals were repaired and the gardens were completely fenced. In view of Expo 76, a Car Park of approximately four acres was being built by the Development Works Corporation in the marshy area near the Labourers' Quarters.

GENERAL

14.7.6.1. The Gardens were closed to the public from the 7th June 1976 to the 19th July owing to the construction of stands for Agricultural Show Expo 76 — held in the Gardens from 1st July to the 11th July 1976. The Show was a great success and attracted around 200,000 visitors to the Gardens during the eleven-day period.

14.7.6.2. Planting of trees in view of replacing those that had been blown down by Cyclone Gervaise had been continued. 116 plants had been planted in the gardens during the year.

14.7.6.3. After Expo 76, with the building of the new Car Park the Royal Botanic Gardens Advisory Committee advised that visitors be not allowed to enter the gardens with their vehicles.

LIVESTOCK

14.7.7.1. There were 19 stags-seven males and twelve females. Originally, there were 16 °tags. However, four females were born during the year and one mature female was given free to the Municipality of Port Louis on the 21th July 1976.

14.7.7.2. There were also 23 tortoises:—Six males, three females and fourteen young ones. Originally, there were 14 tortoises, but nine were born during the months of January and February 1976.

VISITS

14.7.8. 200,341 persons and 28,897 school children visited the Gardens during the year. In addition, approximately 202,000 persons and 5,000 school children visited Expo 76 and the Gardens.

ABERCROMBIE NURSERY

Officer in charge: Senior Technical Officer — F. Lam Kee

HISTORY OF THE NURSERY

The Nursery was created by Dr. Tempany in an endeavour to stop the spread of the Phytalus beetle over the island. Presently, the Nursery supplies Port Louis and the districts of the North with plants.

14.8.2. The Nursery is found in the sub-humid zone (Terre Rouge) with an annual rainfall of less than 50 inches. The soil belongs to a very stony phase of Low Humid Latosols group (Richelieu family.).

14.8.3. Rainfall registered for 1976 was 1,106 mm. or 43,5 inches.

DEVELOPMENT

14.8.4. Terracing of two fields was carried out in order to reduce soil erosion. A system of Drip Irrigation was set up in the Mango Orchard with the help of Mr Eric Felfoldi, an Australian expert. Erection of a new potting shed was started with the help of the Engineering Division of the Ministry.

WEATHER CONDITIONS

14.8.5. Rainfall registered for the year was 1,106.5 mm. or 43.56 inches. Most of the rain falls between January and May.

CROPPING PROGRAMME

14.8.6. Almost all the crops planted on the station during the year had been for seed production purposes — exception bieng made of Cassava. The greatest limitation to the carrying out of the programme was the availability of irrigation water. The crops that had been planted during the year 1976 were: Bitter Gourd; Okra Brinjals; Cassava; Watermelon; Chillies Chinese Giant; Radish and Brede de Chine.

CROPPING PROGRAMME

14.8.7. As in 1975, 4,000 coconuts of the varieties Malayan Dwarf Red and Malayan Dwarf yellow were imported from Malaysia. These were received in September 1976 and sown immediately as received. Delivery of the germinated nuts to the public had been started as from December 1976.

Cuttings propagated during year 1976	:	39,549
Seeds sown during year 1976	:	23,215
Layers and grafts	:	247

EXPERIMENTS

14.8.8. The observation plots of three varieties of Pigeon Pea had been maintained. This experiment was being continued by the Agricultural Division.

DISPOSAL OF PRODUCE

14.8.9.1. The following had been sent to other stations for planting and also for sale:—Seedlings 846 units; Cuttings 3,410 units; Coconut seedlings 145 units; Mango seeds 900 units; Vine grafts 72 units.

SENT TO BARKLY EXPERIMENT STATION AS SEED

14.8.9.2. Okra 258 units; Chillies Chinese Giant 1,014 units; Bitter Gourd 1,251 units; Radish 7 kg 450 gms (rough clean); Brede de Chine 2 kg 350 gms (rough clean); Masson Jujube 496 seeds.

SALES DURING THE YEAR

14.8.9.3. Seedlings 11,956 units; Cuttings 9,972 units; Layers and grafts 2,221 units; Coconut seedlings 2,073 units; Grapes 9.25 kg; Mascarena revaughanii seeds 150 units; Sweet potatoes 647.0 kg; Bitter Gourd 6.0 kg; Cassava 304.0 kg; Mangoes 3,741 units; Brinjals 68.0 kg; Chillies Chinese Giant 639 units; Pawpaw fruits 292 units.

14.8.9.4. Total revenue collected for the year was Rs 18,272.79.

RICHELIEU EXPERIMENT STATION

Officer in charge: Senior Technical Officer — Y. L. Kong Ting Lun

GENERAL

14.9.1. The station is situated in the North West part of the Island at an elevation of 220 ft. above sea level. The climate is excessively dry. Annual rainfall being in the region of 30" (750 m.m.) most of which falls in January, February and March. The soil is reddish and classified as Low Humic Latosol (Richelieu family).

WEATHER CONDITIONS

14.9.2. The climatic conditions for the crops throughout the whole year were satisfactory. The implementartion of the cropping programme has also been facilitated by the supply of irrigation water from La Ferme Reservoir all year round. And it is now agreed that the supply of water would be 1.25 cusec during any drought season. The total rainfall recorded this year amounted to 1042.4 m.m.

14.9.3. *Cropping Programme*

TOBACCO

14.9.3.1. The crop in summer was mainly for seed production. The area planted and the quantity of seed produced for each variety is given below:—

Variety	*Type*	*Field No.*	*Hectareage*	*Seed produced*
Amarello	air cured	B3F1	0.55	4.5 kgs
NC95	flue-cured	B3F1	0.44	10 kgs
YM	flue-cured	B3F2	0.29	1.8 kgs
SC66	fiue-cured	B3F2	0.50	4 kgs
			1.78	20.3

The second season was planted in September and consisted of 0.48 hectare NC95, 0.38 hectare SC66 and 0.18 hectare of air-cured Amarello. The leaf quality was good since the average price per kg of flue-cured leaf obtained was Rs 12.18 which is higher than that of last year Rs 10.76. The fuel consumption was fair averaging 3.23 kgs of cured leaf per gallon of gas oil plus 0.08 cord of firewood which is equivalent to Rs 2.13 per kg of cured leaf. Average price per kg of air-cured leaf obtained was Rs 5.77.

GROUNDNUT

14.9.3.2. 7.39 hectares of groundnut variety local Cabri were planted for seed production. A good crop is expected and will be harvested next year. Last year's planting was harvested and the yield was 3440 kgs.

MAIZE

14.9.3.3. 2.71 hectare of local maize were grown for seed production. The best cobs will be selected and sent to Barkly and the rest will be sold to Livestock Feed Factory.

SWEET POTATO

14.9.3.4. The varieties SM1, SM2, SM3 and SM4 were planted in nursery and in mixed orchard as interrow crop with the object of having enough planting materials to be provided to other stations or planters. Nine new varieties namely chain 69–285, chestnut, chownung 69–219, kwang tung 16, leek, little leaf, peking, white starch, and Yue 70–9 were introduced from Belle Vue Farm.

CANES

14.9.3.5. 349 tons 300 kgs sugar cane have been harvested from 11.44 hectare and sent to Richelieu Livestock Breeding Station as fodder. Out of the 11.44 hectares, 3.4 hectares have been uprooted for tobacco plantation for next year. However, another 6.84 hectares have been planted under the following varieties:—M13/56 (2.6 hectares), S17 (1.44 hectares) and M438/59 (1 hectare). The spacing used for S17 is 7 ft. × 3 ft. and all the three fields have been successfully intercropped with bean.

VEGETABLE SEED PRODUCTION

14.9.3.6. The production of vegetable seeds was carried out according to programme. All produce was sent to Barkly Experiment Station and is listed in paragraph six. The cultivation of bean for seed production was particularly successful. 102. hectares of bean Pioneer has yielded 1005.5 kgs seeds. 2.43 hectare of bean local Red has yielded 3699.5 kgs seeds and 7.84 hectares bean long Tom has yielded 8779 kgs seeds i.e. the station has produced a total of 13 tons 483 kgs bean seeds for this year.

ORCHARDS

14.9.3.7. Routine maintenance works was carried out in all orchards. The cultural operation such as weeding, prunning irrigation and control of pest and diseases were done regularly. The letchi and mango crops for this year were sold by tender.

EXPERIMENTS

14.9.4. The following experiments were carried out by the Scientific Officers of the Agricultural Division.

TOBACCO

14.9.4.1. (1) One variety trial to compare the yield, leaf quality and gross returns of nine varieties of flue-cured tobacco (NC95, SC66, Speight 28, coker 347, SC 72, Speight G33, SC 71, SCR and YM). (This experiment was repeated in September 1976).

(2) One fertilizer trial to determine the optimum level of nitrogen to maximize gross returns of variety NC95. (This experiment was repeated in September 1976).

(2) One experiment to determine optimum time of tobbaco planting. (This experiment was repeated in August 1976).

(4) One experiment on chemical control of suckers. Chemicals used are *(a)* Royal MH, MH30, Royal TAC and offshoot T85.

(5) One weeding experiment.

TOMATO

14.9.4.2. A variety trial to compare the yield potential of nine varieties of tomato (Heinz 1350, Heinz 1370, Regina, Venus, Saturn, Moneymaker, Marglode, Anahu and Marmande.)

PAWPAW

14.9.4.3. An observationel trial on variety Waimanalo.

SWEET PEPPER

14.9.4.4. A variety trial to compare the yield potential of varieties keystone resistant, californian wonder and chinese giant.

LETTUCE

14.9.4.5. One experiment to determine the optimum fertilisation and spacing combination of variety Mignonette.

DISPOSAL OF PRODUCE

14.9.5. *(a)* Sold:— Watermelon 14764 kgs; Mango 806 units; Coconut 115 units; Eureka frost lemon 526 units; Bringelle 125.5 kgs; Asparagus 202 kgs; Oranges 2,515 units; Tangelo 581 units; Sugar cane 204 tons 580 kgs; Iron sheets 1,105 ft.; Guava 103.25 kgs; Lalo 6kgs; Maize cobs 42 units; Manioc 37 kgs; Pipengailles 325.5 kgs; Cucumber 250 units; Tobacco seedlings 34,050; Tomato 617.5 kgs; Sweet potato 6976.75 kgs; Sweet pepper 4,431 units, Bean (green pods) 16.25 kgs; Bean pulses 29 kgs; Cabbage 357 units; Pomme d'amour 1,457 kgs; Lettuce 2930 units; Grapes 30.5 kgs.

Other sources of revenue were:—

(i) Shelling of maize 55.370 tons

(ii) Tobacco flue-cured 3526.2 kgs

(iii) Tobacco air-cured 651.1. kgs

Total revenue Rs 104,249.95

(b) Sent to Livestock Feed Factory:—800 kgs maize

(c) Sent to Livestock Breeding Station:—349 tons 300 kgs sugar cane as fodder

(d) Sent to Barkly Experiment Station for purpose of seed or seedling production:—Baissac mangoes 1,101 units; Maison Rouge Mangoes 2,517 units; Okra TAE 38 1.5 kgs seeds; Okra TAE 38 162 units; Luffa 19 units; Eureka frost lemon 44 units; Asparagus bean 900 gms; Maize cobs 350 units; Mandarin Ponkan 30 units; Groundnut Local Cabri 3,440 kgs; Tomato Money Maker 55.95 kgs; Tomato Marglobe 42.90 kgs; Cotomili Local 195.85 kgs; Bean Long Tom 8519.2 kgs; Bean Pioneer 1005.5 kgs; Bean Pinto 7.02 kgs; Bean Victory 5.67 kgs; Soya Bean 3.88 kgs; Brede de Chine Bouquet 15.7 kgs; Peas Local 256.0 kgs; Bean Local Red 3699.5 kgs; Pomme d'amour Local 1732.4 kgs; Cabbage Local 63.65 kgs; Cowpeas 234.9 kgs; Watermelon Sugar Baby 1493 units; Bringelle Farcie 593 units; Pawpaw Waimanalo 30 units.

(e) Given free of charge:—

9.5 kgs tobacco seeds NC95 1.0 kgs tobacco seeds YM 4.4 kgs tobacco sedds SC66 3.5 kgs tobbaco seeds Amarello	TO TOBACCO BOARD
2. 100 lbs sweet potato ...	... Canon B. Hagg 28 Old Moka Road Belle Rose Quatre Bornes
3. 100 lbs sweet potato ...	... Rector Royal College Curepipe
4. 19 cabbages and 8 lbs tomatoes	... The Secretary Tamil League Port Louis
5. 5 coconuts and 100 lbs sweet potato	The Secretary Parish of Saint Patrick Quatre Bornes
6. 5 coconuts and 100 lbs sweet potato	The President Hindu Mauritian Catholic Association Port Louis

7. 100 lbs sweet potato, 5 coconut and 100 sweet pepper	The Rev. James Ling St. Paul Rectory Plaine Verte Port Louis
8. 125 lbs sweet potato and 5 coconuts	Miss Jeanne Lesur Rue Barron d'Unienville Beau Bassin
9. 200 lbs sweet potato	The Rev. P. A. Cathan Dean St. James' Cathedral Port Louis
10. 75 lettuces and 100 lbs sweet potato	Dr. P. Sungkur Medical Superintendent Brown Sequard Hospital Bean Bassin
11. 116 lbs sweet potato and 100 lettuces	The Venerable Chislain Emmanuel Archdeacon of Mauritius

VISITS ON STATION

14. 9.6. There were visits from students of the University of Mauritius.

TEA EXPERIMENT STATION

Officer in charge: Senior Technical Officer — J. Dindoyal

INTRODUCTION

14.10.1. The Tea Experiment Station — Wooton is found along the main road from Curepipe leading to Quartier Militaire at an elevation of 1850 ft. above sea level within the annual rainfall range of 3800 m.m. The climate is rather cool and the average daily sunshine is of six hours. The soil is of the Brown Forest Latosolic tyre.

14.10.2. An area of 68 arpents is under tea, of which nine arpents were used for experimental purposes during the year.

DEVELOPMENT

14.10.3. An area of 6,800 sq. ft. around the green houses was tarred as well as another area of about 3,500 sq. ft. in front of the office. A normal pipe water supply has been restored and this has helped us to cope with the drought period in November when a large number of potted cuttings would have been affected.

NURSERY

14.10.4. The mother bushes (VP) were pruned to 24½", and were treated with M45 and folimat.

WEATHER CONDITIONS

14.10.5. 1976 has been a rather dry year. The total rainfall was 2460 m.m. i.e. 1500 m.m. below normal which is 3960 m.m. The wettest month was January with a precipitation of 344 m.m. (normal being 530 m.m.) and the driest month was November with a precipitation of 65 m.m. (normal being 301 m.m.).

CROPPING PROGRAMME

14.10.6. The total weight of green leaves harvested was 585,275 half kgs., an all time record for Wooton Tea Experiment Station. This shows an increase of 26.8% over the previous highest yield recorded — 461, 389 half kgs. in 1974.

14.10.7. Besides improvement in general cultural practices, the record yield of this year has been due to the full cooperation of the staff and labourers on the station.

14.10.8. Table III — Yield of Green Leaves for 1972–76 (annexed)

14.10.9. The average yield per arpent (in half kg.) was superior to the highest so far of 1976 by 30%.

TABLE IV

AVERAGE YIELD PER ARPENT (HALF kg.) FOR 1971—1976

Year	*Yield*
1971 ...	6514
1972 ...	5921
1973 ...	6320
1974 ...	6615
1975 ...	6091
1976 ...	8607

TABLE V

FIELD MANAGEMENT

Field No.	*Acreage (arp.)*	1974	1975	1976
1	3.05	Deep skiff	Prune	Unprune
2	3.98	Unprune	Prune	Unprune
3	2.86	Prune	Unprune	Deep skiff
4	4.73	Unprune	Deep skiff	Prune
5	2.40	Unprune	Prune	Unprune
6	3.32	Unprune	Prune	Unprune
7	3.96	Prune	Unprune	Deep skiff
8	5.26	Prune	Unprune	Deep skiff
9	3.29	Prune	Uuprune	Deep skiff
10	2.43	Prune	Unprune	Deep skiff
11	2.44	Prune	Unprune	Deep skiff
12	3.87	Deep skiff	Medium prune	Light skiff
13	1.92	Deep skiff	Prune	Unprune
14	4.93	Prune	Unprune	Deep skiff
15	3.26	Prune	Unprune	Deep skiff
16	3.59	Deep skiff	Prune	Unprune
17	3.40	Deep skiff	Prune	Unprune
18	2.69	Prune	Unprune	Light skiff
19	2.63	Prune	Prune	Unprune
20	0.90	Deep skiff	Medium prune	Unprune

SEED GARDENS

14.10.12. 4,176 half kg. of seeds were collected from the different seed gardens. After testing only 2,633 half kg. were kept; 1,543 half kg. were rejected on account of poor quality.

TABLE VI

SEEDS COLLECTED FROM SEED GARDENS

Seed Gardens	*Total*	*Floaters discarded)*	*Sinkers (retained)*
Parc Aux Cerfs ...	1065	296	769
Salazie	1462	560	902
Nouvelle Decouverte ...	110	50	60
De Rauville	334	155	179
Midlands Betty ...	1175	460	715
CES (Reduit	30	22	8
	4176	1543	2633

EXPERIMENTS

14.10.13. The staff on the station cooperated with the Agricultural Division in various experiments:—

(a) Optimum pruning cycle (one to five years).

(b) Effect on yield of split application of nitrogen.

(c) Optimum rate of application of nitrogen

(d) Effect of N.P.K. application in the year of prune followed by the application of N only during the subsequent years.

(e) Optimum time of prune.

(f) Optimum pruning height.

(g) Optimum tipping height.

(h) Response to phosphorous in presence of mulching.

DISPOSAL OF PRODUCE

14.10.14. 585,275 half kg. of leaves were sent to Dubreuil Tea Factory, 125½ kg. of seeds sold to the Tea Development Authority at Re 1. per half kg. Besides 23,820 potted plants and 144,270 cuttings were issued to the Tea Development Authority.

14.10.15. The Station staff and labour force undertook the planting of shrubs and decorative plants at Grand Bassin and Royal College — Curepipe.

YIELD OF GREEN LEAVES (IN HALF KG.) FOR 1972 — 1976

	1972		1973		1974		1975		1976	
	Yield	*% of total*	*Yield*	*% of total*	*Yield*	*% of total*	*Yield*	*% of total*	*Yield*	*% of total*
January	61,578	14.91	73,056	16.58	80,748	17.50	90,797	21.37	80,363	13.73
February	30,872	12.32	54,520	12.37	52,502	11.59	20,575	4.84	55,900	9.55
March	53,342	12.92	71,808	16.29	71,146	15.64	67,824	5.96	92,620	15.82
April	47,286	11.45	57,802	13.11	53,764	11.65	47,002	11.06	71,140	12.15
May	37,490	9.08	27,988	6.34	31,930	6.92	48,538	11.42	47,840	8.17
June	15,576	3.77	11,766	2.66	11,684	2.53	18,824	4.43	30,880	5.27
July	9,894	2.40	3,758	0.85	4,658	1.01	5,544	1.30	12,080	2.06
August	7,686	1.86	4,924	1.09	2,330	0.50	4,602	1.08	5,252	0.89
September	16,526	4.00	9,390	2.17	10,082	2.19	4,120	0.96	11,940	2.04
October	24,720	5.98	41,782	9.47	34,066	7.39	28,900	6.80	39,760	6.79
November	40,720	9.86	36,226	8.22	39,534	8.57	38,200	8.99	57,200	9.77
December	47,274	11.45	42,866	10.85	67,950	14.52	49,886	11.74	80,300	13.72
TOTAL	412,990		440,788		461,389		424,812		585,275	

APPENDIX A

WEATHER CONDITIONS

CUREPIPE EXPERIMENT STATION

Hereunder, the rainfall record for 1976 compared to the average of the past years.

Month	*Average for 1964–75 (m.m.)*	*Rainfall 1976 (m.m.)*
January ...	440.2	301.5
February ...	447.2	646.7
March ...	337.4	349.5
April ...	275.4	336.3
May ...	238.3	326.3
June ...	202.4	371.5
July ...	235.4	166.9
August ...	230.0	214.4
September ...	132.8	132.3
October ...	117.2	146.0
November ...	124.4	58.7
December ...	238.0	249.2
TOTAL ...		3,299.3

PLAISANCE EXPERIMENT STATION

The total rainfall was 1601.5 m.m. The highest rainfall was during the month of May and the lowest during the month of October.

Below is the rainfall record for 1976 compared with the average of the past years.

Month	*Average for 1964–74 (m.m.)*	*Total rainfall for 1976 (m.m.)*
January ...	206.6	143.9
February ...	172.0	88.6
March ...	218.0	116.1
April ...	191.0	219.3
May ...	129.2	347.7
June ...	105.3	146.7
July ...	116.3	61.4
August ...	78.4	109.2
September ...	60.1	111.1
October ...	60.1	51.4
November ...	81.3	57.8
December ...	133.2	148.5
TOTAL ...	1,551.5	1.601.5

CENTRAL EXPERIMENT STATION

Rainfall — monthly total (m.m.) and difference from average normal.

Month	*Rainfall*	*Average Normal**	*Diff. from Normal*
January	67	243	— 176
February	350	268	+ 82
March	64	297	— 233
April	82	153	— 71
May	87	87	—
June	121	77	+ 44
July	25	72	— 47
August	11	58	— 47
September	34	52	— 18
October	64	41	+ 23
November	26	74	— 48
December	112	130	— 18
TOTAL ...	1,043	1,552	— 509

BARKLY EXPERIMENT STATION

Month	*Actual 1976 (m.m.)*	*Average Normal (m.m.)*
January ...	92.38	187
February ...	244.45	143
March ...	51.26	193
April ...	103.34	104
May ...	107.67	60
June ...	35.59	38
July ...	12.40	45
August ...	41.40	25
September ...	38.40	21
October ...	15.10	31
November ...	43.20	45
December ...	75.50	109
TOTAL ...	860.69	1,001

*Average normal—ref. to climate of Mauritius Table 11.1 (3) (1931–60)

PAMPLEMOUSSES EXPERIMENT STATION

Weather Conditions 1976		*(m.m.)*
January	...	112.0
February	...	277.6
March	...	170.9
April	...	252.7
May	...	210.3
June	...	127.8
July	...	53.9
August	...	134.8
September	...	75.9
October	...	43.4
November	...	81.3
December	...	71.6
Annual Rainfall	...	1612.2

ROYAL BOTANIC GARDENS

Weather Conditions 1976		*(m.m.)*
January	...	112.0
February	...	277.6
March	...	170.9
April		252.7
May	...	210.3
June	...	127.8
July	...	53.9
August	...	134.8
September	...	75.9
October	...	43.4
November	...	81.3
December	...	71.6
Annual Rainfall		1612.2

ABERCROMBIE NURSERY

Weather Conditions 1976		*(m.m.)*
January	...	124.4
February	...	263.6
March		91.8
April	...	144.0
May	...	147.3
June	...	82.3
July	...	28.6
August	...	64.2
September	...	20.7
October	...	44.5
November	...	26.8
December	...	68.3
Annual Rainfall	...	1106.5

RICHELIEU EXPERIMENT STATION

The weather statistics for the year 1976 were as follows:—

Month	*Mean Max °F*	*Mean Min °F*	*Rainfall (m.m.)*
January	83.0	73.6	60.6
February	83.5	75.6	174.0
March	85.5	74.0	81.5
April	83.3	73.0	64.0
May	81.8	72.0	113.0
June	80.0	70.3	39.0
July	81.0	71.5	8.5
August	85.4	73.6	23.3
September	86.0	71.7	19.6
October ...	85.4	71.5	0.9
November	86.0	70.7	20.0
December	86.1	72.7	138.5

TEA EXPERIMENT STATION

TABLE I

RAINFALL

Month	*Rainfall (m.m.)*	*Average Normal*	*Diff. from Normal*
January	344.6	530	— 185.4
February	232.6	455	— 222.4
March	244.3	530	— 285.7
April	268.9	453	— 184.1
May	318.2	313	+ 5.2
June	319.2	272	+ 47.2
July	131.8	310	— 178.2
August	192.4	281	— 88.6
September ...	64.4	187	— 122.6
October	144.7	142	+ 2.7
November ...	65.0	192	— 127.0
December ...	133.6	301	— 167.4
TOTAL ...	2,459.7	3,966	— 1506.3

TABLE II

AVERAGE MINIMUM AND MAXIMUM TEMPERATURES
RELATIVE HUMIDITY

Month	*Average Min. Temp. °F*	*Normal Min. Temp. °F*	*Diff. from Normal Min.*	*Relative humidity%*
January ...	63.0	64.74	— 1.74	93.2
February ...	63.8	64.40	— 0.60	86.5
March ...	63.6	64.04	— 0.44	93.4
April ...	57.5	62.60	— 5.10	91.3
May	61.4	60.80	+ 0.60	84.4
June ...	59.2	56.84	+ 2.36	89.8
July	56.2	56.30	— 0.10	92.5
August ...	60.4	55.76	+ 4.64	92.5
September	58.0	56.30	+ 1.70	90.2
October ...	60.4	57.92	+ 2.48	87.4
November ...	61.0	59.18	+ 1.82	80.8
December ...	66.1	61.88	+ 4.22	87.4

Month	*Average Max Temp. °F*	*Normal Max °F*	*Diff. from Normal*
January	79.4	78.80	+ 0.60
February	80.1	79.34	+ 0.76
March	81.8	79.34	+ 2.46
April	77.3	77.54	— 0.24
May	78.0	75.74	+ 2.26
June	76.1	71.42	+ 4.68
July	66.6	68.18	— 1.58
August	71.8	69.26	+ 2.54
September	64.6	70.08	— 5.48
October	71.8	72.14	— 0.34
November	75.4	76.46	— 1.06
December	71.8	78.26	— 6.46

APPENDIX B

SEEDS ISSUED — 1976

	Sold at Barkly E.S.	*Issued free to stations and demonstration centres*	*Total*
	Kgs	*Kgs*	*Kgs*
Acacia	171.750	—	171.750
Bean	4,302.125	1,712.854	6,014.979
Beetroot	5.782	1.619	7.401
Bokla	21.750	35.288	57.038
Brede de chine	146.350	6.587	152.937
Brede Kotachee	178.620	5.017	183.637
Brede Martin	34.615	2.419	37.034
Bringelle (varieties Cipaye, Farcie, Rosita)	8.878	1.433	10.311
Cabbage	2.975	1.220	4.195
Cauliflower	13.772	2.973	16.745
Callebasse	54.910	3.217	58.127
Chillies	12.482	0.693	13.175
Cotomili	136.625	19.165	155.790
Cowpeas Chinese	121.945	3.907	125.852
Cucumber	31.910	2.370	34.280
Groundnut local cabri	3,350.000	2,238.000	5,588.000
Giraumon	37.872	3.623	41.495
Lalo	26.195	2.543	28.738
Lettuce	7.067	1.205	8.272
Patisson	4.728	1.864	6.592
Patole	9,522	0.302	9.824
Peas	1,962.500	331.906	2,294.406
Petsai	5.853	0.879	6.732
Pipengaille	59.160	4.251	63.411
Pomme d'amour	27.132	1.061	28.193
Rave	28.250	2.919	31.169
Radish	5.936	1.609	7.545
Rice	1,045.000	403.519	1,448.519
Salsify	2.142	0.086	2.228
Tomato (Marglobe, Money-maker)	3,318	0.708	4.026
Watermelon Sugarbaby ...	15.981	3.705	19.686

APPENDIX C

	Seedlings	*Cuttings*	*Layers/graft*	*Coconut seedlings*
Ornamentals ...	7843	21,118	618	
Fruit trees ...	19784	1,930	7,199	
	27627	23,048	7,817	2,151

Total sales + Free issues at Abercrombie and Barkly Experiment Station.

XV. LIVESTOCK BREEDING STATIONS

Head of Division: Y. Aumjaud, Agricultural Superintendent

15.1. The Livestock Breeding Stations include stations at Curepipe, Palmar, Richelieu and the Poultry Breeding Centre.

CUREPIPE LIVESTOCK BREEDING STATION

MILCH CATTLE

15.2.1. At the end of the year, the Curepipe Livestock Breeding Station carried a total of 227 heads of milch cattle — 45 males and 182 females. There were 81 calvings during the year — 43 males and 38 females. The average birth weight was 29.7 kgs and weaning weight at 90 days, 72 kgs. The number of calves weaned during the year were 42 males and 24 females. There were three cases of stillborn and 1 case of prolapse.

Sale : 29 bulls and 40 cows were sold for slaughter through the Mauritius Meat Authority.
32 bulls, one cow and one heifer were sold for breeding.

Death : 9 calves and 1 cow died during the year

Transfer : In February 20 cows distributed in 1973 to the members of the Nandini Cooperative Society at Carol Village were returned to the station. Two were so emaciated that they had to be sold immediately for slaughter.
During the year one old cow was returned from the Rivière des Anguilles Demonstration Centre and one pregnant heifer was issued; further one bullcalf and two heifers were received from the Demonstrations Centres of the Extension Services.

MILK PRODUCTION

15.2.2. Over a lactation period of 305 days, the average production was 6.8 kgs of milk per head per diem. The first calvers yielded an average of 5.3 kgs of milk per head per diem; the best performer yielded 7.5 kgs with a peak of 10 kgs. Second calvers yielded an average of 7.3 kgs of milk per head per diem; the best performer yielded 8.7 kgs with a peak of 16 kgs. Third calvers yielded an average of 8.4 kgs of milk per head per diem, the best performer yielded 10.3 with a peak of 16.0 kgs. Cows with more than three calvings gave an average of 7.1 kgs of milk per head per diem; the best performer yielded 7.8 kgs with a peak of 11.0 kgs.

15.2.3. The Experiment 75/1 on Molasses/Bagasse mixture for milk production, which started in April 1975 continued up to the 20th of June 1976, from then onwards all the cows under this experiment were shifted to the normal feed.

15.2.4. The total quantity of milk produced during the year was 147,459.2 litres; out of which 120,388.0 litres were issued to the Milk Pasteurisation plant, 26,355.6 litres were fed to calves, piglets and rabbitlings and 715.6 litres were discarded due to mastitis.

MILK PASTEURISATION PLANT

15.2.5. 120,388.0 litres of milk received from the station and 17 litres brought forward for 31st December, 1975 were handled at the Pasteurisation Plant. 110,251.0 litres of pasteurised milk and 9,077.5 litres of raw milk were sold to the hospitals. 30 litres were sold to staff. 127 litres which turned sour had to be discarded, 423.5 litres were sent for analysis, 252.0 litres were issued to the Dairy Chemistry Division for experimentation in Yoghourt manufacture. The loss of milk occured on pasteurisation during the year amounted to 244.0 litres.

PIGS

15.2.6. At the end of the year, the total number of pigs at the station was 50 — 13 sows, 2 boars, 3 gilts and 5 young boars kept for replacement and 27 piglets. 218 piglets were farrowed with an average of 9.5 piglets per litter. The average birth weight of the piglets was 1.3 kg. During the year 23 litters were recorded; 22 litters were weaned with an average of 7 piglets per litter. The average weaning weight at 8 weeks old was 13.0 kg per piglet.

Sale : 4 sows, 3 boars, 1 gilt and 3 weaners were sold for slaughter. 139 pig weaners were sold to the Pig Credit and Marketing Co-operative Society for distribution to members of the society throughout the island.

Death : 74 piglets died during the year.

Purchase: 1 boar and 6 young boars were purchased from Savannah Sugar Estate.

Transfer : 2 boars were transferred to the Palmar Livestock Breeding Station.

RABBITS

15.2.7. At the end of the year the total number of rabbits was 168 — 3 bucks, 11 does and 154 rabbitlings. There were 57 kiddings duting the year yielding a total of 208 rabbitlings. The death amounted to 125 — 55 adults and 70 rabbitlings. 53 rabbits were sold to breeders and 34 sold for slaughter. 14 adults were issued to the Plant Pathology Division and the Division of Veterinary Services.

NEW ZEALAND CATTLE

15.2.8. During the year 13 female calves and 12 male calves were received from Palmar Livestock Breeding Station and 5 male calves were collected from Cowkeepers of the Rural Development Project.

Death : Three died

Transfer : In September of the same year 9 heifer calves and 3 bull calves were transferred to the Richelieu Livestock Breeding Station.

GOATS

15.2.9. 5 goats culled and returned from the Extension Services were sold for slaughter.

RICHELIEU LIVESTOCK BREEDING STATION

NEW ZEALAND CATTLE

15.3.1. The 248 heads of New Zealand cattle — 8 sires, 38 cows, 150 heifers and 52 calves at Richelieu Livestock Breeding Station were transferred in January to the Palmar Livestock Breeding Station, in order to prepare the station to quarantine the cattle which were expected to arrive in the country.

15.3.2. The main event of the year was the arrival on the 7th April, by Air Cargo, from New Zealand of 270 heads of cattle of about 6 to 9 months old. The animals were transported to the station mainly by contract lorries, modified for this occasion. The caisson of each lorry was partitioned which facilitated the smooth transport of the animals from Airport to Richelieu Livestock Breeding Station. The cattle arrived safely except a few which were very weak and one that died on the plane.

15.3.3. Once the quarantine was lifted, more animals were transferred from other Stations.

Transfer : (i) 9 heifercalves and 3 bullcalves were received from Curepipe Livestock Breeding Station.

(ii) 2 sires, 224 heifercalves and 142 bullcalves were received from Palmar Livestock Breeding Station.

(iii) 8 cows, 7 heifercalves and 5 bullcalves were collected from cowkeepers of the Rural Development Project.

Death : 2 heifers, received on 7th April, died during the year and also 14 calves of those transferred to the station.

Sale : Out of the eight cows collected from the cowkeepers in the Rural Development Project, 7 were sold for slaughter.

At the end of the year the station carried 2 sires, 1 cow, 267 heifers, 208 heifercalves and 10 bullcalves of the New Zealand stock.

MILCH CATTLE

15.3.4. At the end of the year the station carried a total of 18 heads of creole cattle — 2 sires, 15 heifers and 1 young bull. They were all transferred from Palmar Livestock Breeding Station during the year.

SAHIWAL CATTLE

15.3.5. During October 38 heads of Sahiwal cattle were received from the Division of Veterinary Services.

Birth : 3 births were recorded — 2 heifercalves and one bullcalf.

Death : 1 bullcalf died.

Sale : 4 cows were sold for slaughter.

At the end of the year there were 36 heads of Sahiwal cattle — 3 bulls, 17 cows, 3 heifers, 7 young bulls, 5 heifercalves and 1 bullcalf.

MILK PRODUCTION

15.3.6. During the year 3256.1 litres of milk were produced, out of which 1274.5 litres were fed to calves, 1878.9 litres were sold to staff and 102.7 litres were discarded.

DEVELOPMENT

15.3.7. In June, one chipper, make "Rivière Casalis" and one mixer make "Gehl 280" were received. The chipper was put in use in July of the same year.

15.3.8. The construction of the Dairy Unit was still going on at the end of the year. The first wing was nearly completed, but was not functional and work on the second wing had started.

PALMAR LIVESTOCK BREEDING STATION

15.4.1. At the end of the year the Palmar Livestock Breeding Station carried a total of 99 heads of cattle — 4 sires, 10 young bulls, 14 bullcalves, 63 cows, 1 heifer and 7 heifercalves. There were 26 calvings during the year — 16 males and 10 females. The average birth weight and weaning weight was 25 kgs and 60 kgs respectively.

Sale : 5 bulls and 3 cows were sold for slaughter.

Death : 1 cow, 2 bulls, 1 young bull and 4 calves died during the year.

Transfer : 2 sires were transferred to the Division of Veterinary Services.
2 sires, 1 young bull and 15 heifers were transferred to the Richelieu Livestock Breeding Station.
1 bullcalf was received from Flacq Demonstration Centre.

NEW ZEALAND CATTLE

15.4.2. At the end of the year, the station carried a total of 799 heads of of New Zealand cattle — 18 sires, 11 young bulls, 170 bullcalves 419 cows, 17 young females and 164 heifercalves

During the month of January 248 heads of New Zealand were received on the station from Richelieu Livestock Breeding Station. There were 498 calvings during the year.

The Rural Development Programme was maintained; 3 pregnant cows were distributed, 42 cows and 102 weaned calves were collected from cowkeepers.

Death : 68 heifercalves, 53 bullcalves and 7 cows died during the year

Sale : 102 young male calves, 21 cows were sold to breeders and 262 cows were sold for slaughter.

Transfer : 6 young bulls were transferred to the Entomology Division.
2 sires and 366 calves were transferred to the Richelieu Livestock Breeding Station. 25 calves were transferred to the Curepipe Livestock Breeding Station.

HERD CATTLE

15.4.3. At the end of the year there were 37 heads of Ongole, 54 heads of Boran and 221 heads of Zebu cattle. The herd consisted of 28 bulls, 38 young bulls, 34 bullcalves, 61 cows, 120 young heifers and 31 heifercalves. 95 calvings were recorded during the year.

Sale : 90 heads of herd cattle were sold — 15 males to carters, 46 females and 9 males to the Mauritius Meat Producers Association for breeding and 20 culls to the Mauritius Meat Authority for slaughter.

Death : 2 cows, 2 heifers, 2 young bulls and 15 calves died during the year.

GOAT

(a) Anglo-Nubian

15.4.4. At the end of the year there were 183 Anglo-Nubian goats — 76 males, 107 females on the Station; 115 kids — 59 males and 56 females were born, with an average birth weight and weaning weight of 2.5 kgs and 15.5 kgs respectively.

Death : 11 adults and 35 kids died during the year.

Sale : 23 males and 33 females were sold to breeders through the Extension Service Division. 13 males and 10 females were sold for slaughter.

(b) Jumna Pari

15.4.5. At the end of the year there were 101 Jumna Pari goats at the station consisting of 32 males and 69 females. 54 births were recorded — 22 males and 32 females. The average birth weight was 2.5 kgs and average weaning weight 17.9 kgs.

Death : 2 adults and 13 kids died.

Sale : 3 males, 9 females and 2 kids were sold to breeders throuhg the Extension Service Division. 7 males, 2 females were sold for slaughter.

SHEEP

15.4.6. At the beginning of the year the 9 sheep left were sold for slaughter.

PIGS

15.4.7. At the end of the year there where 156 pigs at the station — 3 boars, 23 sows, 3 gilts and 127 piglets.

523 piglets were born during the year.

Death : 1 sow, 2 gilts and 231 piglets died.

Sale : 1 boar, 6 young boars, 11 sows, 9 gilts were sold for slaughter and 293 weaners were sold for the production of meat to the Pig Credit and Marketing Co-operative.

Transfer : 2 boars for reproduction were transferred from Curepipe Livestock Breeding Station.

RABBITS

15.4.8. The small unit of rabbits was maintained. At the end of the year, the station carried a total of 27 rabbits — 3 males, 5 females and 19 rabbitlings. During the year 75 rabbitlings were born.

Death : 46 rabbitlings died during the year.

Sale : 12 adults and 32 young rabbits were sold for table and breeding respectively.

MILK PRODUCTION

15.4.9. During the year 62,151.4 litres of milk were produced. The average yield per day per cow was 3.9 litres. Out of the total milk produced 26,931.1 litres were fed to calves, piglets and kids, 21895 litres were sold to the Flacq Hospital and the remaining 13324.8 litres were sold to staff of the station.

MISCELLANEOUS

15.4.10. During the year manure was continuedto be sold to the public and to the Development Works Corporation. By the end of the year 1593.393 tons were sold and 61.375 tons were issued to other Divisions.

15.4.11. The Agricultural Division carried out an experiment on fodder grass and onion plantation. Twenty kgs of march set and 2 beds each, of Yellow Granex and California Red were sowed in February, 1976. 500 lbs of onion, and 70 lbs of yellew Granex were harvested in June/July 1976.They were sold on the station to staff.

15.4.12. An Experiment on Citrus was also started. 72 grafts were planted in September. Elephant grass was also planted to have some fodder for the station.

DEVELOPMENT

15.4.13. The first wing of the Dairy Unit was almost completed by November. Gates and roofing are yet to be completed. Construction of the second wing was started in December.

POULTRY BREEDING CENTRE

15.5.1. The Poultry Breeding Centre maintained parent stock of Ranger and Sykes Tinted from Ross Poultry Limited for the production of layers. In addition the centre maintained Ross I Broiler parent stock for the production of broiler chicks.

15.5.2. During the year the Poultry Breeding Centre hatched a total of 147,224 chicks. 50,687 day-old pullets, 6,396 month-old pullets for the production of eggs were sold to poultry keepers.

15.5.3. To help the production of poultry meat 24,623 day-old broilers and 59,439 day-old and month-old male chicks from laying stock were sold. 4050.200 kgs of dressed chickens and culls were sold for table. The Centre also provided 35 chickens to the Animal Health Laboratory, 60 chickens to the Analyst Division of the Ministry of Health and 340 month-old pullets to the Ministry of Co-operative and Co-operative Development.

HYBRID RANGER

15.5.4. A total of 81,761 Hybrid Ranger chicks were produced, of which 35,388 day-old pullets, 3822 month-old pullets, 40,685 day-old cockerels and 203 month-old cockerels were sold.

HYBRID SYKES TINTED

15.5.5. A total of 37,185 Hybrid Sykes Tinted chicks were produced of which 15,299 day-old pullets, 2,574 month-old pullets, 18,547 day-old cockerels and 4 month-old cockerels were sold.

BRIOLER CHICKS

15.5.6. 28,278 day-old broilers were produced during the year, of which 24,623 were supplied to small poultry keepers.

EGG PRODUCTION

15.5.7. During the year 329,710 eggs were produced at the Poultry Breeding Centre and 2,594 eggs for table were received from the Curepipe Experimental Station. The monthly egg production of the various breeds maintained during the year was as per Appendix „A".

15.5.8. Out of the 329,710 eggs produced and 1,273 eggs carried forward from the year 1975 and 2,594 eggs received, 207,837 eggs were incubated for the supply of chicks to the public, 2,260 eggs were issued to the Animal Health Laboratory, 2.840 eggs to the Artificial Insemination Laboratory and 108,025 eggs sold for table, mainly to the Brown Sequard Hospital. The Stock in hand at the 31st December was 11,372 eggs.

REPRODUCTIVE PERFORMANCE

15.5.9. During the year under review 147,224 chicks were hatched. The average fertility and hatchability were 87.70% and 72.30% respectively of all eggs set.

The monthly reproductive performance of all breeds maintained at the centre was as per Appendix "B".

The monthly reproductive performance of all parent stock, breedwise, was as per Appendix "C".

IMPORT OF PARENT STOCK

15.5.10. To meet the demands of layers for the next season the following were imported from United Kingdom :—

(i) Ranger Parent stock : 924 day-old pullets and 144 day-old cockerels.

(ii) Sykes Tinted Parent stock : 504 day-old pullets and 80 day-old cockerels.

For the production of broiler chicks 410 day-old Ross parent stock pullets and 62 day-old cockerels were imported.

ANIMAL HEALTH

15.5.11. The Poultry Breeding Centre carried an average of 15,091 birds of all ages on a monthly basis. The mortality in adult stock during the year was 9.5% and in the group 0 — 12 weeks the mortality was 11.6%.

APPENDIX A

RECORD OF MONTHLY EGG PRODUCTION 1976

Month	*P.S. Ranger*	*P.S. Tinted*	*P.S. Ross*	*Mixed hybrid*	*Total*
January	3881	4140	4218	1975	14,214
February	1942	7917	3443	1649	14,951
March	18650	7849	2883	1604	30,986
April	22711	6811	2540	1365	33,427
May	21893	6624	2750	1320	32,587
June	18991	6343	—	315	25,649
July	20502	6413	72	715	27,702
August	19710	6746	2084	2821	31,361
September	17435	6178	6077	3435	33,125
October	16427	6021	6524	3488	32,460
November	14676	5342	5903	3143	29,064
December	10930	4475	5532	3247	24,184
TOTAL ...	187748	74859	42026	25077	329,710

APPENDIX B

MONTHLY REPRODUCTIVE PERFORMANCE OF ALL BREEDS

Month	*No. of egg set*	*No. Fertile*	*No. of chicks hatched*	*% of Fertility*	*% hatched of fertile*	*% hatched of all egg set*
December 1975			2292	90.78	84.88	77.06
January ...	3697	3365	2852	91.01	84.75	77.14
February ...	8317	6685	5252	80.37	78.56	63.14
March ...	22205	18694	15401	84.18	82.38	69.35
April	21096	18376	15269	87.10	83.09	72.37
May	22373	19268	16596	86.12	86.13	74.17
June	24869	22033	17805	88.59	80.81	71.59
July	5064	4472	3646	88.30	81.52	71.99
August ...	25382	22780	18725	89.74	82.19	73.77
September ...	21592	19348	15200	89.60	78.56	70.39
October ...	21302	18679	15116	87.68	80.92	70.96
November ...	27101	23119	18008	85.30	77.89	66.44
December {	3537* 1302	1190	1062	91.39	89.24	81.56
TOTAL ...	207837	178009	147224	87.70	82.37	72.30

Annexure B (*) Set in December 1976 chicks hatched in January, 1977.

APPENDIX C

THE MONTHLY PERFORMANCE OF ALL PARENT STOCK BREEDINGS FOR YEAR 1976

Month	P. S. Ranger					P. S. Tinted					P. S. Ross Broiler				
	Number of eggs set	*Number fertile*	*Number of Chicks hatched*	*% fertility*	*% hatched*	*Number of eggs set*	*Number fertile*	*Number of Chicks hatched*	*% fertility*	*% hatched*	*Number of eggs set*	*Number fertile*	*Number of Chicks hatched*	*% fertility*	*% hatched*
December 1975													2292*	90.78	84.88
January ...											3697	3365	2852	91.01	84.75
February ...						5030	3748	2915	74.51	77.77	3287	2937	2337	89.35	79.57
March ...	10694	8914	7439	83.35	83.45	8390	7076	5937	84.33	83.90	3121	2704	2025	86.63	74.88
April ...	13654	12126	10311	88.80	85.03	5290	4397	3756	83.11	85.42	2152	1853	1202	86.10	64.86
May ...	13945	12681	11413	90.93	90.00	5763	4965	4193	86.15	84.45	2665	1622‡	990	60.86	61.03
June ...	17391	15822	13130	90.97	82.98	7150	5922	4444	82.82	75.04	328	289	231	88.10	79.93
July ...	3633	3338	2812	91.87	84.24	1431	1134	834	79.24	73.54	—	—	—	—	—
August ..	17591	16070	13441	91.35	83.64	6855	5849	4534	85.32	77.51	936	861	750	91.98	87.10
September ...	10727	9630	7337	89.77	76.18	5502	4673	3504	84.93	74.98	5363	5045	4359	94.07	86.33
October ...	10445	9167	6991	87.76	75.26	5216	4233	3420	81.15	80.79	5641	5279	4705	93.58	89.12
November ...	14405	12198	8887	84.67	72.85	6020	4680	3648	77.74	77.94	6676	6241	5473	93.48	87.69
December											3537† 1302	1190	1062	91.39	89.24
TOTAL ...	112485	99946	81761	88.85	81.80	56647	46677	37185	82.39	79.66	38705	31386	28278	88.11	80.78

* 2974 eggs set in December 1975, 2292 chicks come out in January, 1976.
† 3537 eggs set in December 1976, chicks hatched in January, 1977.
‡ Poor hatch due to increase in temperature in the setter.

XVI. ENGINEERING DIVISION

Head of Division: A. R. Satar, Principal Agricultural Engineer

16.1. The division consists of 3 sections:

(i) Farm Machinery

(ii) Farm Buildings

(iii) Soil and Water/Irrigation

16.2. The Farm Machinery Section is responsible for the design of Agricultutral equipment, testing of imported equipment and carrying out improvements to suit local conditions if necessary and advise other divisions on the choice of equipment. The workshop of this section carries out the servicing, maintenance and repairs of all vehicles and equipments of the Agricultural Services and manufactures structural members for the Farm Buildings Section and office furniture for the Agricultural Services and does as well the installation of pumps and piping networks for the Irrigation Section

16.3. The Farm Building Section is responsible for the design and construction of Farm and Office Buildings for the Agricultural Services.

16.4. The Soil and Water Section is responsible for research and design in the field of irrigation, soil and water conservation and drainage. This section has been responsible for the design of the irrigation system for the small scale Irrigation Scheme. This scheme is involved in providing irrigation facilities to plots of 10–15 acres belonging to small farmers where underground water is available. It is not possible to use surface water on account of the existing laws on surface water Rights.

FARM MACHINERY SECTION

16.5. The number of vehicles and equipments and their maintenance and repairs were as follows:—

Items	*Number at 31.12.75*	*Addition during 1976*	*Deletion during 1976*	*Existing on 31.12.76*	*Service & Repairs*
Lorry	20	6	2	24	249
Land Rover	17	2	4	15	259
Van	19	10	1	28	222
Car	10	3	—	13	123
Tractor	25	6	—	31	147
Sprayer	54	2	7	49	32
Motorcycle	8	—	—	8	16
Pumps	13	3	—	16	7
Dumper	1	—	—	1	3
Broomwade Compressor ...	3	—	—	3	6
Atlas Copco Compressor ...	—	1	—	1	—
Trailer	37	—	—	37	76
Lawn Mower	49	10	5	54	266
Weighbridge	4	—	—	4	2
Concrete Mixer	2	2	—	4	6
Implements	34	3	—	37	14
Workshop tools and equipments	20	3	—	23	15

16.6. A seed cleaner for handling light seeds has been developed.

16.7. Three submersible pumps were connected to the underground piping system at l'Esperance Trebuchet under the small scale Irrigation Scheme.

16.8. Modifications were carried out on a Forage Harvester and a Feed Mixer for use by the Livestock Breeding Station.

16.9. The following were manufactured:—

152 steel Tubular divisions

4200 feet of steel angle purlins

128 Trusses for livestock feedlots

2 Trusses for Implement shed at Belle Vue

2 Gates for Royal Botanic Gardens

200 Brackets for drinking bowls

10 Doors for Dog Quarantine Station

6 Bodies for new lorries

6Sluice gates for Terre Rouge Land Settlement

6 Canopy frames for tractors

FARM BUILDING

16.10. Architectural plans and working drawings were prepared for the following:

Boiler Room for Sericulture project

Office Block at Palmar Livestock Breeding Station

Bunker silo at Palmar and Richelieu Livestock Breeding Stations

Concrete molasses tank at Palmar and Richelieu Livestock Breeding Station

Implement shed at Belle Vue.

AGRICULTURAL SHOW AT ROYAL BOTANIC GARDENS

16.11. The division designed and supervised the erection of the stands for the show. The workshop facilities were provided to all divisions in the putting up of the exhibits. Various items like tables, stools and brackets were manufactured in the workshop.

SOIL AND WATER

16.12. The existing irrigation system at Barkly and Reduit Experiment Stations has been improved. An overhead irrigation system has been designed for 10 acres at the Sugar Cane Nursery for seed production.

A drip irrigation system has been set up for the orchards at Le Reduit (6 acres) and Abercombie Nursery (2 acres).

XVII. FIELD SERVICES

Head of Division: M. M. Sooltangos (Agricultural Superintendent)

17.1. The Field Services comprised the following sections:

1. Transport Section
2. Livestock Feed Factory
3. La Brasserie Fodder Plot
4. Nouvelle Decouverte Station
5. Cowfeed Subsidy Scheme
6. Reduit Grounds
7. Le Reduit Canal (Syndic).

TRANSPORT SECTION

17.2. A fleet of 88 vehicles made up of tractors, lorries, vans, jeeps, land rovers and cars supplied service to the different divisions of the Ministry.

17.2.1. The jeeps, land rovers and cars were mainly used for conveyance of officers, specialists, field staffs, or for group tours and the payment of wages and salaries to personnel employed on outstations.

17.2.2. The lorries and tractors were concerned with transport and field operations.

THE LIVESTOCK FEED FACTORY

17.3. The production of feedstuff for livestock saw a substantial increase with the implementation of the cowfeed subsidy scheme for small cowkeepers.

17.3.1. The tonnage of feeds manufactured during the year amounted to 3,844,270 tons of which cowfeed represented 2,547 tons 680 kg.

17.3.2. The table below shows the amount of the different feedstuff produced and the price and value they were sold.

Type of Feed	*Total production (kgs)*	*Sale Price/ Ton (Rs)*	*Total Value Sale (Rs)*
Poultry Feed ...	545,440	1414	771,252.16
Chick Feed ...	96,000	1504	144,384.00
Pig Grower ...	230,750	1356	312,897.00
Pig Starter ...	69,900	1369	95,693.10
Creep Feed ...	19,570	1601	31,331.57
Bull Feed ...	48,675	1302	63,374.85
Calf Feed ...	12,390	1646	20,393.94
Horse Feed ...	95,450	1216	116,067.20
Special Horse Feed	159,700	1304	208,248.80
Cowfeed ...	2,547,680	1062	2,705,636.16
Rabbit Feed ...	18,715	1360	25,452.40
			4,494,731.18

17.3.3. The revenue from sale amounted to Rs 4,494,731.18 of which the sum of Rs 438,425.90 was collected at Rose Hill Extension Shop.

LA BRASSERIE FODDER PLOT

17.4. The fodder plot, planted under setaria grass, provided a daily supply of fodder to Curepipe Livestock Breeding Station and Reduit Veterinary Service. Fodder was also supplied periodically to Palmar Breeding Station and Richelieu Feedlot. The Prisons Department also called at times of scarcity, to collect fodder.

17.4.1. Total fodder supplied amounted to 2672 tons 813 kg, distributed as follows: Curepipe Livestock Breeding Station: 2244 tons 323kg, Veterinary Services Division: 171 tons, Palmar Breeding Station: 40 tons, Richelieu Prisons: 121 tons 600 and contractor: 95 tons 890.

NOUVELLE DECOUVERTE STATION

17.5. The station was mainly concerned with the production of fodder and the plantation of mulberry for the Sericulture Section of the Entomological Division. An area of 7 arpents under setaria grass and 5 arpents under elephants grass were maintained and fodder supplied mainly to the Veterinary Services Division. Some 105 tons of setaria grass and 90 tons of elephant grass were thus provided. About 4 arpents of mulberry was planted under mulberry bringing the total acreage under that crop to about 9 arpents.

THE COWFEED SUBSIDY SCHEME

The Scheme came under implementation at the beginning of the month of June. The Scheme's objective, which is to promote cowkeeping and increase milk production in the country, was to put at the disposal of small cowkeepers, cowfeed at the subsidised price of 27½ cents/lb at the rate of 1 kg/cow/day. 7,064 cowkeepers registered themselves for the scheme and some 472 tons 625 of feed were sold at 18 feed sale centres, opened for that purpose in localities spread over the country.

17.6.1. A mixture of bagasse/molasses used as cowfeed and prepared specially for the Ministry by St. Antoine Sugar Estate, were also sold at the cowfeed sale centres at 23 cents/lb. Some 324 tons of the mixture were sold at these places.

REDUIT GROUND, BUILDING AND WORKSHOPS

17.7. The ground and buildings of the Head Office were properly maintained during the year.

17.7.1. Blacksmith and carpentry workshops provided regular services on various odd jobs to all the divisions of the Ministry at Head Office as well as at outstations.

LABOUR COORDINATION

17.8. The occasional and seasonal labour requirements of the different divisions was centrally coordinated.

REDUIT CANAL (SYNDIC)

17.9. The management of the canal remained the responsibility of the Field Services Division An adequate supply of water to the riverains could not be assured owing to the bad condition of the canal .Heavy silting restricting normal flow of water, damaged flanks and poor flooring causing a substantial loss of water by seepage, were the main sources of trouble. Cleaning, repair works and consolidation operations were carried out intermitently so as not to stop the normal supply of water completly during long periods.

XVIII EXTENSION SERVICES

Head of Division : R. Brunet, Divisional Scientific Officer, up to 8.7.1976
S. P. Mauree, Acting Divisional Scientific Officer from 9.7.76

CONTACT WITH FARMERS

INDIVIDUAL CONTACTS

18.1.1. The number of individual visits paid by Extension Officers to crop plantations was 15,048. Field visits covered the whole range of crops grown over the island (excluding Tobacco) with greater attention being given to sugarcane, potato, onion, maize, rice, groundnut, tomato and tea.

18.1.2. Home visits in the evenings to sugarcane growers with low yield records were lower than the previous year due to limited staff. The number of planters contacted through this approach amounted to about 516.

18.1.3. Some 6,301 visits were paid to breeders of the major classes of livestock including cattle, goat, rabbit, poultry and pig. Particular attention was paid to cowkeepers receiving New Zealand cows. Such breeders were visited twice monthly for general advice and more specifically on feeding, housing, heat detection, aspects of livestock management.

GROUP MEETINGS

18.2.1. 148 group meetings related to crop production were held on evenings by Extension Officers and were attended by 2,038 planters. The main topics dealt with were the cultivation of major crops viz— sugarcane, onion, groundnut, potato, maize, rice, tea, tomato, ginger, pine apple with stress being laid on extension priorities such as spacing, weedicide use, pest and disease control, and fertilisation. Similarly 31 meetings on livestock production were laid and were attended by some 586 breeders. The main topics discussed were cow management, with special reference to housing, heat detection, calf rearing, milking techniques and feeding, goat management, rabbit and poultry keeping.

CONDUCTED TOURS

18.3. 16 tours were organised during the year and over 221 planters were taken on visit to sites of agricultural interest. Sugarcane planters were shown weedicide and fertiliser demonstration plots and new cane varieties. Foodcrop growers visited localities where improved farming practices were adopted. Moreover interested participants were shown silkworm rearing on the Permanent Demonstation Centres.

MODEL PLANTERS

18.4. 18 planters cultivating major crops viz sugarcane, maize, potato, onion, tomato, groundnut, and vegetables were selected and regularly visited by Extension Officers. These planters were advised on their crop management practices and were closely followed — hence representing model planters to the farming community in their respective localities.

USE OF MASS MEDIA

18.5. A series of 38 talks on various aspects of crop production and protection and livestock husbandry were prepared and presented by Officers of the Division on the Television in both in Creole and Bhojpuri for the farming community. However only 16 talks were delivered on the radio in Creole; the radio talks had to be discontinued during the second half of the year owing to the departure of the officer concerned.

FIELD DEMONSTRATIONS

18.6. A total of 155 demonstrations were laid down in planters' fields in the course of the year. Greater attention was paid to sugarcane and major crops. 40 demonstrations on fertiliser usage and 26 demonstrations on chemical weed control were laid in sugarcane fields belonging to small planters. Some 51 demonstrations on chemical control of pests and diseases on the major crops were laid besides 25 demonstrations on the use of weedicides in foodcrops. Morever 6 fertiliser demonstrations were effected in potato, 4 in onion, and 3 others in groundnut.

PUBLICATIONS

18.7. Farming News were being published regularly every month through which planters were kept informed of latest research findings and recommendations in both crops and livestock husbandry. Each issue was printed in 1,400 copies and were distributed widely to the farming community and concerned organisations.

18.7.2. About 602 advisory leaflets on sugarcane, maize, groundnut, rice, onion, garlic, potato, fruit trees, goats and poultry were printed and distributed in evening meetings as and when required.

18.7.3. 2,259 M.S.I.R.I. booklets dealing with major crops viz sugarcane, potato, maize and groundnut were distributed to planters.

18.7.4. Moreover during the period of the Agricultural Show (Expo—76) special leaflets were prepared on several topics viz: Agricultural Extension Services, Agricultural Diversification, Weedicides in foodcrops, Agricultural Youth Club Movement, Poultry keeping, Rabbit keeping, Fruit trees growing and Onion cultivation; each was turned out in 1,500 copies and distributed.

PERMANENT DEMONSTRATION CENTRES AND EXTENSION OFFICES

18.8.1. The 4 Permanent Demonstration Centres and the 7 Extension offices continued to function as regional centres for extension activities. Several new demonstrations were effected on the Demonstration Centres viz: use of Cobex in onion and garlic, Linuron in potato, peas and beans.

18.8.2 The latest varieties of sugarcane B 51129 and M 356/53 were planted in all the 4 demonstration Centres as well as other regional recommended varieties e.g. S 17, M 438/59, M 124/59, M 351/57 for demonstration purposes and in some cases those varieties provided planting materials for interested planters.

18.8.3. New varieties of tomato (Saturn and Venus), cabbage, petsai, sweet potato, ribbed gourd, maize hybrids, potato (Mariline), water melon, asparagus were cultivated in demonstration plots at the Centres. Besides other crops were also grown in the respective seasons in demonstration of good management practices.

18.8.4. Planters could avail of sweet potato vines, banana suckers and pine apple, rice seeds and fruit plants from the centres.

18.8.5. A unit of several classes of livestock e.g. rabbits, goats, poultry and cattle was maintained at all centres.

18.8.6. Silkworm rearing from mulberry plantations on the centres continued in 3 demonstration centres.

18.8.7. A few crosses of Jumna Pari and Anglo Nubian goat breeds were produced on the stations and were sold to the public in view of improving their local stock. 43 goat services were effected at the centres for the benefit of goat breeders of the vicinity. Moreover several breeders brought their rabbit (does) for services on the centres.

18.8.8. The centres served as venue and training ground during the Agricultural Training Course organised for members of youth organisations and the Agricultural Trainees.

18.8.9. Sales of feed for the major classes of livestock were being effected on the demonstration centres. The 4 Permanent Demonstration Centres and the 7 Extension offices were kept open as usual on three afternoons weekly to receive request for advice from farmers.

DEMONSTRATION CENTRE, MAPOU

18.8.10. About 2,307 kgs of foodstuffs, 2,623 litres of milk, 4,294 eggs were produced. 6,540 kgs of livestock feeds, 350 packets of seed, 27 goats and 17 rabbits were sold. Total sales amounted to Rs 17,989.97.

DEMONSTRATION CENTRE, RIVIÈRE DES ANGUILLES

18.8.11. About 2,787 kgs of foodstuffs, 986 litres of milk and 3,558 eggs were produced. 13,211 kgs of livestock feed, 1,171 packets of seed, 54.625 Kgs of seeds, 20 fruit trees, 15 Guide de Culture Potageres et Vivrieres, 7 goats and 8 rabbits were sold. Total sales amounted to Rs 23,526.27.

DEMONSTRATION CENTRE, PLAISANCE

18.8.12. About 3,155 kgs of foodstuffs, 1,035 litres of milk, 4,380 eggs were produced. 8,030 kgs of livestock feed, 450 canes, 658 packets of seed, 66 fruit trees, 56 Guide de Culture Potagères et Vivrières, 2 goats, and 15 rabbits were sold. Total sales amounted to Rs 18,941.45.

DEMONSTRATION CENTRE, FLACQ

18.8.13. About 2,888 kgs of foodstuffs, 1,888 litres of milk, 2,088 eggs were produced. 11,280 kgs of livestock feed, 68 packets of seed, 92 fruit trees, 74 Guide de Cultures Potagères et Vivrières and 26 goats were sold. Total sales amounted to Rs 23,520.61.

PROPAGATION AND DISTRIBUTION OF SUGARCANE VARIETIES

18.9. The currently recommended varieties e.g. M 13/56, S 17, M 438/59, M 124/59 were grown on the Demonstration Centres. The Extension Officers helped in the distribution of planting materials of the sugarcane variety B 51129 during its first release when 21 small planters bought 699 gaulettes of standing canes.

ASSISTANCE TO FARMERS

18.10.1. Some 155 soil samples were taken on sugarcane fields belonging to planters. Analysis and fertiliser recommendations were made accordingly.

18.10.2. 68 goats of improved breeds (Anglo Nubian and Jumna Pari) were sold to breeders in view of improving their stocks. Moreover 43 goat services were effected on the Stations. 80 persons were registered at regional demonstration centres in view of taking up Sericulture.

FOODCROPS

18.11.1. Foodcrop cultivation registered an increase of some 200 arpents over the previous year mainly due to increase in interline cultivation. Cropping in interlines increased by some 618 arpents over the previous year. The total effective acreage under foodcrops was estimated at 9,829 arpents, out of which 2,532 arpents of pure stand equivalent were inter-cultivated in sugarcane lands.

18.11.2. The main crops in sugarcane interlines were the following with their respective gross acreages:

Potato ...	... 3,510 arpents
Groundnut ...	... 842 arpents
Maize ...	... 655 arpents
Bean ...	... 232 arpents
Tomato ...	... 185 arpents

18.11.3. Creepers and peas were other crops grown on significant arceages.

18.11.4. Potato was grown over 1,867.8 arpents comprising of 1,566 arpents of pure stand equivalent intercropped in sugarcane lands. The total production was estimated at 11,945 metric tons and the average yield per arpent was 6.4 metric tons.

18.11.5. The acreage under groundnut increased to 897 arpents, out of which 410 arpents were cropped in sugarcane interlines. The total production was estimated at 1,150 metric tons and the average yield per arpent fell to 1.3 metric ton.

PESTS AND DISEASES

18.12. *Sugarcane*—The incidence of scale insects "Pulvinaria iceryi" was reported islandwide. Infestation in sugarcane fields was more prevalent in the sub-humid areas and varieties M 13/56 and S 17 showed particular susceptibility Degree of infestation ranged from mild to very severe. A few cases of borer's attack were reported in certain localities.

No outbreak of gummosis was observed.

Potato—Blight disease was reported to have been serious during the first planting season. Other diseases of importance noted, were seed rot and leaf roll.

Groundnut—Rust outbreak persisted in groundnut plantations. No effective control could be achieved with present fungicide recommendations. Heavy defoliation occurred and reduced yield was recorded.

Cercospora leaf spots and leaf tier insect attacks continued to be the major setbacks to this crop; nevertheless control was achieved by effective usage of pesticides

Onion Garlic— Purple blotch was considerable in these two crops. Blight and pink root were less severe. Thrips damage was of importance in certain neglected plantations.

Tomato—Stemphyllum and Blight diseases were not of particular importance due to good preventive measures. However, attacks of Red spider mites were very severe and reduced tomato yields.

Fruit flies and Heliothis spp though severe were kept under control by insecticide sprays.

Pine apple—Mealy bugs and wilt complex continued to be the problem on this crop against which insecticides were not very successful.

Natal fruit fly—This pest still poses the biggest problem on fruit trees.

Rhinoceros Beetle is reported to be under good control.

WORK WITH YOUTH

18.13.1. The total number of Agricultural Youth Clubs was 95. Work with the youth was based mainly on the training of club members, imparting agricultural education and organising agricultural competitions supplemented by cultural activities, such as Essay Competitions and football tournament.

18.13.2. Two training courses were organised for 121 members from Agricultural Youth Clubs.

18.13.3. 37 meetings were held which were attended by 470 members.

18.13.4. The total visits paid to Agricultural Youth Club members by Field Assistants amounted to 1,024 and 9 tours were organised whereby club members were taken to places of agricultural interest.

18.13.5. About 62 film shows were held for the benefit of the members.

18.13.6. A Kitchen Garden Competition was organised with a participation of 550 members from 40 clubs; moreover 160 members from 23 clubs participated in a Rabbit Raising Competition.

18.13.7. A football tournament was also organised wherein 26 clubs participated.

18.13.8. Prizes were awarded to winners of the various competitions held at the Demonstration Centres and Réduit respectively.

18.13.9. The Federation of Agricultural Youth Clubs, grouping clubs of Grand Port and Savanne districts functioned smoothly. The Federations grouping clubs for other districts were less active.

MISCELLANEOUS ACTIVITIES

18.14.1. A start was made in organising a competition among potato growers. 57 farmers participated in the competition and 40 planters have had their yields successfully assessed by regional officers. Winners were sought out in categories based on planting date and climatic conditions. The National Winner obtained a yield of 20 tons per arpent; moreover a few other participants obtained yield of the order of 15 tons per arpent. This exercise indicated the scope for yields improvement by the small farmers.

18.14.2. The Division presented a stand during the Agricultural Show held in July 1976 with prominent display of the theme "Agricultural Diversification" through cane interrow cropping, institutional measures for price support, operation of the advisory service, greater usage of fertilisers and rational use of pesticides through exhibits, charts, etc. supported by explanatory leaflets.

18.14.3. Moreover a miniature model cowshed appropriate to the needs and circumstances of small cowkeepers was exhibited.

18.14.4. The Division encouraged the participation of farmers in the show 15 farmers brought their produce and after assessment of their quality, prizes were awarded.

18.14.5. Moreover the Divisional Scientific Officer, Mr R. Brunet ensured the coordination with the Ministry and the organisers.

18.14.6. A preliminary survey of foodcrops under cultivation for the Agricultural Census was carried out by the newly appointed Agricultural Trainees.

18.14.7. Visits were also paid to certain school gardens and kitchen gardens of poor institutions, the Probation Hostel and the S.S.R. Hospital.

18.14.8. The Division jointly with the Ministry of Education assisted in a potato growing project in 43 schools. The Extension Officers provided the necessary advice and a Field Assistant assisted in the assessment of the project.

18.14.9. Upon the request of the Ministry of Youth & Sports a seminar was held on two saturdays and a kitchen Gardening and a Rabbit Keeping Competition followed; the necessary assessment was made by officers of the Division.

18.14.10. Two lectures were given by the Acting Divisional Scientific Officer to Village Development Officers in their programme In-Service Training.

18.14.11. 388 maize and bean permits were delivered to planters.

18.14.12. The Division assisted the Youth Guidance Service in preparing its programme of "Careers in Agriculture".

18.14.13. The Divisional Scientific Officer served in different committees viz: Irrigation, Man & Biosphere, Pesticide Control Board.

LIAISON WITH AGRICULTURAL RESEARCH INSTITUTIONS

18.15.1. Close liaison continued to be maintained with the Research Division of the Ministry, the M.S.I.R.I. and other related institutions with reference to field problems and latest findings. In this connection the following talks at the M.S.I.R.I. were attended by the officers of the Division.

Date	*Subject*
4th May ...	" Performance d'une petite recolteuse " japonaise dans les champs de canne à sucre d'Okinawa
18th May ...	" Revue des travaux du M.S.I.R.I. en 1975 " (Champs)
25th May ...	" Revue des travaux de la Division de Technologie Sucrière en 1975 "
15th June ...	" Nouveaux developpements dans la lutte contre le mildiou de la pomme de terre "
20th July ...	" Fertilisation de la canne à sucre "
10th August ...	" Les insectes nuisibles aux épis de maïs "
21st September ...	" Resultats des essais industriels avec le ripener *Polaris* "
12th October ...	" Controle des mauvaises herbes dans (i) la canne; (ii) les cultures vivrières "
9th November ...	" Developpements dans l'irrigation "
14th December ...	" Variétés de cannes à sucre pour la grande culture "

18.15.2. Moreover the staff attended a talk on Citrus Greening delivered by the Divisional Scientific Officer, Pathology, which was followed by a field demonstration of oxytetracycline hydrochloride injection.

SURVEYS

18.16.1. Routine surveys undertaken by the Division were the following:

(i) Weekly recording of market prices for vegetables

(ii) Assessment of foodcrop production

(iii) Survey of area under potato and onion and their production for the Agricultural Marketing Board

(iv) Assessment of herbicide damage on foodcrops

(v) Investigation of fodder problems

(vi) Assessment of milk production of New Zealand cows distributed to cowkeepers

18.16.2. Other surveys conducted were foliar diagnosis in planters' sugarcane fields, sugarcane planting material survey and a farmyard manure survey.

18.16.3. In the month of February with the posting of 25 Technical Assistants and 50 Samplers from the Arbitration and Control Board, the survey of fertility status of fields belonging to small planters through Foliar Diagnosis was resumed. It was conducted in 508 fields altogether comprising of 179 fields survey in 1974 (Series A), 247 new fields in rainfed areas (Series B) and 82 fields in the Northern Plaine Irrigation Pilot Project (Series C). Each field was sampled twice and the survey ended by the third week of April. The samples from Series A and B were analysed at the Mauritius Sugar Industry Research Institute while those of Series C were analysed by the Division of Chemistry, Ministry of Agriculture, Natural Resources and the Environment.

18.16.4. In Series 'A' 29.0% of the fields were deficient in Nitrogen, 19.5% in Phosphate and 43.0% in Potash while in Series 'B' 16.6% of the fields were found deficient in Nitrogen, 18.2% in Phosphate and 40.4% in Potash. In Series 'C' the overall levels of Nitrogen and Phosphate were good while 30% of fields surveyed showed a Potash deficiency.

18.16.5. Upon termination of the above, a survey of planting material used by sugarcane planters was conducted. Out of 171 plantations surveyed, about 8.5% of the planters were found to utilize cuttings obtained from the Sugar Planters Nursery, Pointe aux Sables, 69.3% used planting materials from their own fields, 8.5% obtained materials from Sugar Estates, 10.8% obtained them from other planters' fields. Moreover planting of unsuitable setts (insect infested, etc.) were found to be of the order of 16.8% and the practice of knife disinfection when preparing cane setts was observed only in 12.3% of the planters surveyed.

18.16.6. Further a survey of farmyard manure was undertaken in which 113 samples were collected for analysis.

STAFF AND STAFF MOVEMENT

18.17.1. The staff movement has been considerable during the reporting period. The Divisional Scientific Officer was promoted as Principal Agricultural Officer and was replaced by the Scientific Officer Agronomy on an acting appointment. Later a new Scientific Officer was posted to the Division. One Agricultural Superintendent was transferred elsewhere; moreover his successor went on Overseas leave and a further replacement had to be effected.

18.17.2. In the grade of Senior Technical Officer, two Officers left the Division and only one was replaced. Moreover two Technical Officers were assigned the duties of senior Technical Officers in the Division.

18.17.3. Two Technical Officers left and late in the year the Division was strengthened by 16 new Technical Officers of whom 10 were posted in crop extension, 4 in livestock extension, 1 in the Audio Visual Section and one in the Rural Youth Section.

18.17.4. Three Field Assistants joined the University and 39 Agricultural Trainees were recruited and posted in the Division at the beginning of the year of whom 23 opted for crop extension while 16 for livestock extension. However 5 Agricultural Trainees were transferred elsewhere whilst 2 left the service.

TRAINING AND IN-SERVICE TRAINING

18.18.1. Five officers were sent overseas for further training during the reporting period. One Senior Technical Officer and one Technical Officer went to Egypt. One Senior Technical Officer was sent to Australia to follow a course in Radio Broadcasting while one Technical Officer followed a training in Livestock Extension. Moreover one Technical Officer went to Germany to attend a seminar in Rural Youth.

18.18.2. As a result of the large number of recruits in the grade of Agricultural Trainees, a programme of 100 lectures of one hour duration on agriculture was prepared and delivered to them by the Technical Staff of the Division throughout the year.

APPENDIX

ESTIMATED FOODCROP PRODUCTION IN 1976

The following tables were prepared from data collected by the Division.

Crop	*Area Harvested (Arp)*		*Estimated Average yield (Kgs/Arpent)*		*Estimated Total Commercial Production (Metric Tons)*	
	1975	*1976*	*1975*	*1976*	*1975*	*1976*
Maize ...	1232	1500	970	1057	1195	1584
Manioc ...	28	36	7535	7222	211	260
Arouille ...	26	32	3730	4281	97	137
Sweet Potatoes ...	22	16	5318	5187	117	83
Groundnut ...	859	897	1478*	1282*	1270*	1150*
Irish Potato ...	1482	1868	6422	6394	9518	11944
Beans & Peas ...	663	644	1457	1416	966	912
Pine apple ...	96	160	5031	3906	483	625
Brinjal	132	86	5621	5651	742	486
Tomatoes ...	1493	1343	4033	4050	6021	5439
Ginger	120	132	6250	6257	750	826
Creepers ...	996	878	5858	6466	5835	5671
Mixed vegetables ...	1315	1199	6135	5557	8067	6641
Banana ...	894	832	4141	9733	3702	8098
Rice	244	243	2033	1913	496	465
TOTAL ...	9602	9866	—	—	39470	44321

The acreages shown above were effective acreages harvested and include the aggregate acreages of different crops grown on the same land in one year as well as foodcrops interplanted with sugarcane.

* Fresh weight

XIX. PROJECTS IMPLEMENTATION DIVISION

Head of Division: K. Ramdaursing — Divisional Scientific Officer

NORTHERN PLAINS IRRIGATION PILOT PROJECT

19.1.1. The Northern Plains Irrigation Pilot Project Water User's Co-operative Society held three meetings of the Executive Committee and two general Assembly meetings one for the election of office bearers on the executive committee and the other to determine the cost of irrigation.

IRRIGATION SEQUENCE AND RAINFALL

19.1.2. 13 irrigations on a cycle varying from 10 to 13 days were carried out. On 15 occasions rainfall recorded in this area was more than 1" (25 m.m.). The rainfall distribution is tabulated:

TABLE I

Month	*Rainfall more than 1"*	*Rainfall (mm.)*	*Rainfall (inches)*
January ...	2 occasions	157.7	6.30
February ...	4 occasions	262.6	10.50
March ...	2 occasions	157.3	6.29
April ...	2 occasions	171.0	6.84
May ...	1 occasion	181.8	7.27
June ...	1 occasion	111.1	4.44
July ...	—	42.8	1.71
August ...	1 occasion	134.2	5.36
September ...	1 occasion	53.9	2.15
October ...	—	26.4	1.05
November ...	1 occasion	46.2	1.84
December ...	—	26.9	1.07
TOTAL ...	15	1371.9	54.87

ELONGATION OF SUGAR CANE

19.1.3. Observations on the elongation of canes irrigated and non irrigated were carried out. Average height of canes at the beginning of the observations i.e. January 24th was 70 cm for non-irrigated and 97 cm for irrigated canes. However, with the abundant rainfall recorded both irrigated and non-irrigated canes showed constant growth. In July, the irrigated canes measured 300 cms. while non-irrigated 270 cms. In case of one planter, only 3 irrigations were carried out due to a lack of pipes. The difference in height of canes in this field as compared to other irrigated fields was well marked.

19.1.4. Area under irrigation and yields

(a) Sugar Cane

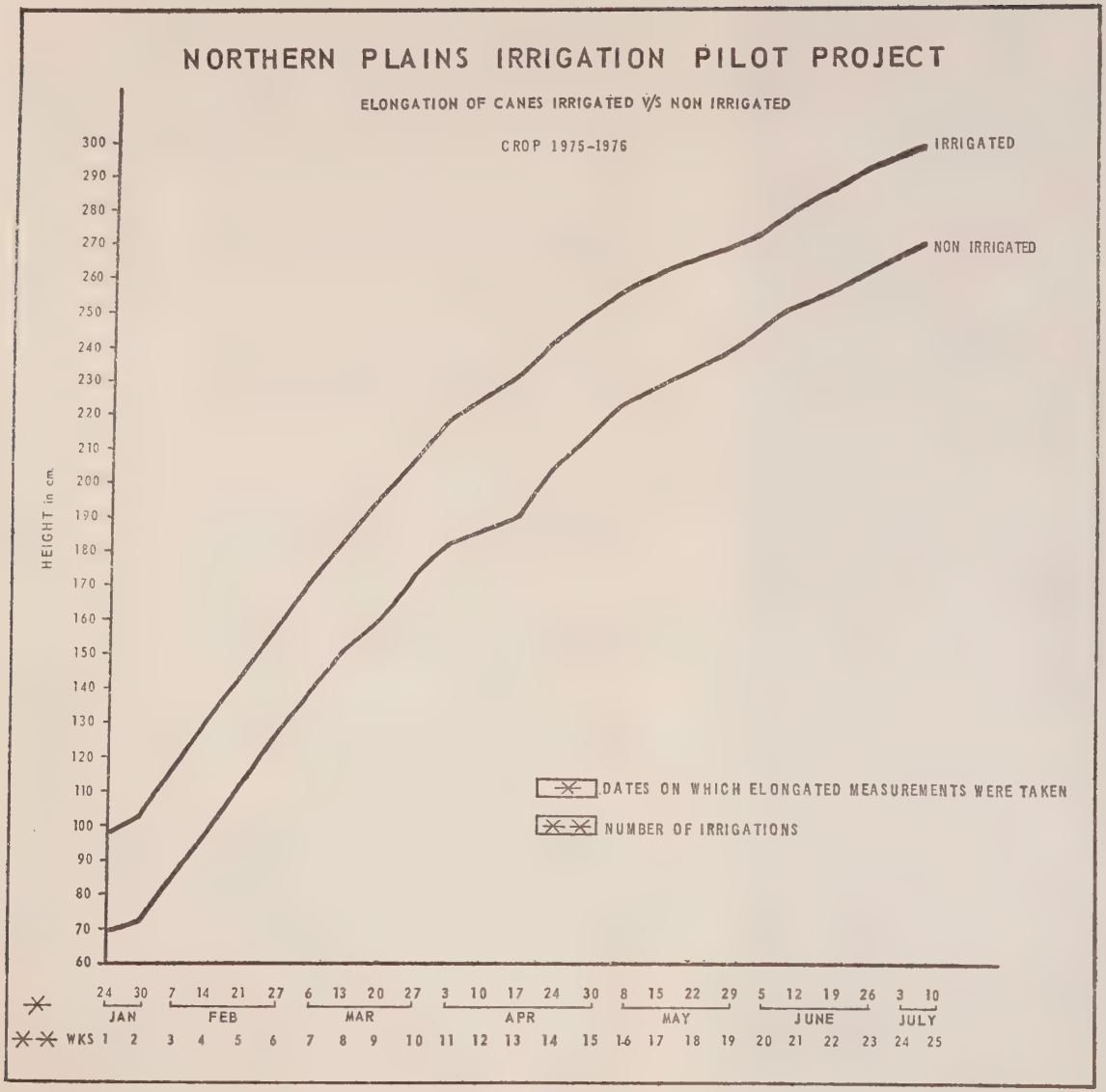
Group (arpent)	*No. of planters involved in each group*	*Acreage (arpent)*	*Production (tons)*	*Average yield groupwise (ton/arp.)*
0 — 0.99	25	11.18	538	48.1
1 — 4.99	43	77.33	3845	49.7
5 — 9.99	4	27.45	1343	48.9
10and above ...	4	100.00	5174	51.7
TOTAL ...	76	215.96	10900	50.4

(b) Non-Sugar crops in the Project Area

Crop	*Acreage*		*Yield per Arpent*
Groundnut ...	3A00	Interline*	600 kg (dry)
Tomato	1A75	Interline*	3500 kg
Maize	A50	Interline*	200 kg
Tobacco	4A00	Pure stand	
TOTAL ACREAGE ...	9A25*		

* Acreage converted into Purestand

TONS PER ARPENT
60
50
40
30
20
10
1974
39.5 T/A
IRRIGATED
1974
21 T/A
NON IRRIGATED
1975
31.5 T/A
IRRIGATED
1975
(10–12 T/A)
NON IRRIGATED
1976
50 T/A
IRRIGATED
1976
35 T/A
NON IRRIGATED
1974
1974
1975
1975
1976
1976
YEAR


NORTHERN PLAINS IRRIGATION PILOT PROJECT
ELONGATION OF CANES IRRIGATED V/S NON IRRIGATED
CROP 1975-1976
IRRIGATED
NON IRRIGATED
HEIGHT in cm.
300
290
280
270
260
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
DATES ON WHICH ELONGATED MEASUREMENTS WERE TAKEN
NUMBER OF IRRIGATIONS
24 30 7 14 21 27 6 13 20 27 3 10 17 24 30 8 15 22 29 5 12 19 26 3 10
JAN FEB MAR APR MAY JUNE JULY
WKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

ANALYSIS OF HARVEST RESULTS

19.1.5. Records have been kept in the Pilot Project of harvest data for the three years of its operation. In all the cases the yield of irrigated canes has been far better than non irrigated canes. However, the differences in yield have varied due to climatic conditions. The full potential of the Northern Plains Irrigation Project could not be shown in the first two years of its operation due to late commencement of irrigation in the first year (1973 — 74) and the bad effect of cyclone Gervaise in (1975).

TECHNICAL DIFFICULTIES

19.1.6. In the course of the year, 33 power cuts were recorded, the starter was repaired twice and on six occasions the Target Master had to be repaired. During harvest, maintenance work was carried out on the butyl-sheet lined reservoir. The major constraint, however, has been the too frequent pipe bursts/punctures.

In two years of operation 12 aluminium portable pipes have been damaged beyond repairs. It is felt that the life expectancy given to the pipes viz. 10 years would be covered with difficulty because of the rough terrain on which they have to be used. It is anticipated that with time more repairs would be warranted. In view of the heavy costs involved, it is suggested that trial be made with light steel pipe which is reasonably harder.

SMALL SCALE IRRIGATION PROJECT

19.2.1. Under this project irrigation water would be supplied to both small and large planter's land falling outside the scope of the main irrigation schemes (i.e. Northern Plains Irrigation Project and Western Coastal Region Irrigation Project). It is anticipated that some 3,000 arpents would be covered under this scheme.

DRILLING OF SMALL WELLS

19.2.2 Prospection for underground water continued during 1976. In all nine (9) boreholes were drilled, of which six (6) yielded water sufficient for ecomonic exploitation.

Fourteen (14) additional requests from planters were received. Of these some necessitated the grouping of farmers into co-operative societies, others could not be considered under this scheme because their land fell under the main irrigation projects.

IRRIGATION SCHEME AT L'ESPERANCE TREBUCHET

19.2.3. Originally it was planned to irrigate 230 arpents falling under the scheme by using 10 boreholes drilled in the project area. Further investigation showed that yield of some of the boreholes had dropped below expectation and that one which had a yield of 140 gpm, had shown an increase in yield to 540 gpm. Accordingly the scheme was revised. It was phased into two (2) stages. Stage I now operational, is using low pressure medium sprinklers, and covers an area of some 120 arpents. In Stage II, it is proposed to draw water from the 540 gpm borehole making use of high pressure sprinklers (Target Master).

The plan with the proposed pipe reticulation system has been prepared. The preparation of detailed engineering design has been undertaken by the Engineering Division of the Ministry. Pipes for the reticulation system have been purchased.

IDENTIFICATION OF NEW IRRIGATION PROJECTS

19.2.4. Two additional irrigation shemes were identified at Trou D'eau Douce and Pointe aux Piments. It has been observed that that there is sufficient water to irrigate 100 arpents at Trou d'Eau Douce and 30 arpents at Pointe aux Piments. A cadastral survey for these regions has been made available.

NORTHERN PLAINS IRRIGATION PROJECT

IMPLEMENTATION OF STAGE I

19.3.1. The Stage I of the project, which covers land in the central area of the Northern plains in the vicinity of Triolet and the Pilot Project, would irrigate on completion of all works an area of about 4,345 arpents.

The works under Stage I have been divided into six parts, the description of which is as follows:—

NP1 — Repairs to La Nicolière Feeder Canal.

NP2 — Construction of diversion weirs modules, channels and pipeline on rivers Vacoas and Chevrettes.

NP3 — Remodelling of canal structures.

NP4 — Repairs and membrane lining to feeder canal.

NP5 — Construction of outlet at La Nicolière Reservoir and steel pipeline connection to the existing head works.

NP6 — Supply and laying of pipes.

19.3.2 PHYSICAL PROGRESS

NP1

By December 1976, 76% of the works under contract NP1 were completed and the major part of the works to be done were in the bitumem lining.

NP2

Only one tender for the contract was received; the price quoted was considered too high.

Following a proposal by the Committee, the Central Water Authority agreed to look into the possibilities of undertaking NP2 A & B by direct labour. Thereafter the Central Water Authority submitted an estimate of works under

NP2 B.

Preliminary work had started. Site clearing both at Riviere Vacoas and Riviere Chevrette were being carried out. Almost all equipment required for NP2 had been purchased by the Central Water Authority.

NP3 and NP4

Lack of competition among local contractors and the subsequent high prices quoted for NP2 led the Northern Plains Irrigation Project Committee to decide to call for tenders from both Mauritian and International Contractors.

NP5 and NP6

Two draft contract documents for NP6 were submitted to the Committee. Other copies of these documents, including those of NP5, were being held at Cambridge until a decision as to the methods of financing the works would be reached.

In February 1976, a CDC/ODM mission visited Mauritius and carried out a detailed investigation on the Stage I of the Northern Plains Irrigation Project. The Mission submitted its report in December 1976.

WESTERN COASTAL REGION IRRIGATION PROJECT

19.4.1. Following Government's approval of the project appraisal report, discussions were held with an EDF mission in April 1976, in the course of which the phasing and financing of the project were reviewed.

The revised phasing is as follows:

Year	*System*	*Acreage (acres)*
1.	La Ferme	3,638
2.	La Chaumiere	2,288
3.	Saint Pierre	3,020
4.	Magenta	4,891
5.	Palma Beaux Songes ...	3,067
		16,904

The EDF has in principle, agreed to the financing of the phase I of the project i.e. La Ferme System. It was also agreed that EDF would consider financing:—

(i) the completion of the hydrogeological survey

(ii) the appraisal of the Guibies project — i.e. the possibility of using the water after power generation at Guibies for irrigation in the Northern end of the Western Coastal Region.

and(iii) the detailed engineering designs for three phases of the project.

Proposals thereon have been submitted to Government for consideration.

VISITORS

19.5. The following personalities and representatives of international bodies have visited the project:

January : Representative of Frederic Ebert Foundation.
University Students/Test Chemists led by Mr. Ruhee.

February : Mr Patel, reporter of " Express ".
Mr Ensor, Mr Cashin, Mr Grieveson (ODM Rep.).
Chinese Embassy Representatives, and Chief Agricultural Officer.

June : Mr Addeji (Economist).
Mr Gnynneevasys & Mr Prosper — APG Integrated Project Ltd.
Mr Morris, visiting Lecturer with Mr Oogarah (DSO Land Use).
Mr Duncan Sheil (Overseas Survey & British High Commission).
Overseas Students (Economists).

August : Mr Haine, Mr Phillips, Mr Thwaite, Mr Tout (CDC Rep.)
Minister Jaypal, Ministry of Co-operatives.
Dr. Prasad.

XX. Land Use Division

Head of Division: P. Oogarah, Divisional Scientific Officer

20.1. The Land Use Division is responsible for:—

(a) Land Use and Soil Conservation

(b) Land Settlements

(c) Technical assistance in the execution of the Agricultutal projects in the Rural Development Programme of the Ministry of Economic Planning and Development

(d) Liaison between the Agricultural Services in Rodrigues and the Specialists Divisions of the Agricultural Services at Reduit.

LAND USE

20.2. The Division's principal objective is to assist in making optimum use of the very limited land resource of Mauritius. Particular emphasis is placed on rational land use and safeguard of good agricultural land.

20.2.1. There has been an increase in built-up areas mostly at the expense of agricultural land. Land use implications of applications for subdivision of agricultural land for non-agricultural purposes were therefore carefully considered.

20.2.2. Advice on land use and soil conservation was given to other Divisions and to planters as well. The Divisional Scientific Officer was member of an ad-hoc committee set up by the Ministry of Housing, Lands and Town and Country Planning to advice on the suitability of agricultural zones in Township Areas. As a result of several working sessions, relevant maps of the area relating to potential land suitability, actual land use, land ownership and irrigation projects were prepared.

LAND SETTLEMENTS

20.3. There are in all fourteen settlements under the control of the Division. They are situated at Petit Sable, Grand Sable, Crown Land Belle Vue, Richelieu, Terre Rouge, Palmar, The Vale, La Cave, Plaisance, Papavert, Bee Manique, Buffer Zone, Moona and Elysee.

20.3.1. There are 600 tenants in all the settlements and the number of holdings is 754. The area of each holding varies from 0.25 arpent to 4 arpents. Terre Rouge and Richelieu Settlements are supplied with irrigation water.

20.3.2. Rent collection was satisfactory. However, several cases of non-payment of arrears of rent had to be referred to the Crown Law Office for necessary action.

20.3.3. There was one meeting of the Land Settlement Committee. Cases of transfer and the question of rentals were the main items considered.

20.3.4. The Committee approved 21 cases of transfer and recommended the following rentals for land in the Land Settlement Scheme:—

(1) Rs 165.— per arpent for land provided with irrigation water or for land in the humid zone, used for the cultivation of sugar cane.

(2) Rs 120.— per arpent for land without irrigation or for land in the drier regions, used for the cultivation of sugar cane.

(3) Rs 120.— per arpent for land used for the growing of foodcrops.

20.3.5. It was also agreed that slopy land with poor accessibility and very rocky land would be given special consideration and the appropriate rental would be determined after examining each case.

RURAL DEVELOPMENT AGRICULTURAL PROJECTS

20.4. The Rural Development Agricultural Committee under the chairmanship of the Principal Agricultural Officer(Development) met once a month with a view to follow up the progress of work in the rural development agricultural projects.

20.4.1. The following fodder areas were developed:

Grand River South East ...	5 acres
Carol	20 acres
Riviere des Creoles ...	10 acres
Cap Malheureux ...	13 acres

20.4.2. Follow up of the cows distributed under the Rural Development Programme was continued by officers of the Livestock Extension Service and of the Animal Health Division. The Livestock Extension Officers advised on animal nutrition and management in general and the officers of the Animal Health Division provided artificial insemination facilities and advice on animal health.

20.4.3. It was found that most of the cows were badly housed. It was decided by the Rural Development Agricultural Committee that the Rural Development Unit may provide some assistance in the improvement of cowsheds. The Rural Development Unit agreed to assist cowkeepers by providing materials needed for the improvement of their cowshed and a programme of cowshed improvement under the technical assistance and supervision of the Livestock Extension Service was, therefore, started. The Extension Service also provided technical assistance in the SelfHelp Projects — rabbit keeping and kitchen gardening.

20.4.4. Some cowkeepers returned their cows on grounds of unruliness of the animal, delayed pregnancy or inability to collect fodder.

RODRIGUES

20.5. The Agricultural Superintendent visited Rodrigues Island in July. A number of posts in the technical grade were vacant. Recruitment was difficult as there were no suitably qualified candidates in Rodrigues. The problems of quarters for accommodating officers from Mauritius was very acute and transport for staff movement was limited as well. The island looked green, having had some rainfall during the months of April, May and June.

XXI. AGRICULTURAL DIVISION, RODRIGUES

Officer-in-charge: J. F. Kwet-On, Acting Agricultural Superintendent.

GENERAL

21.1. It seems as though the rainfall is returning to the normal. This was more abundant than in the previous year as indicate the figures below, but still plenty of rain distributed over several years is required to replenish most of the springs of the island which have dried out.

	1975	*1976*	*Normal for 10 years*
Pointe Canon ...	633.4 mm	859.4 mm	1,249 mm
Solitude	885.8 mm	1,169.0 mm	2,008 mm
Lataniers	839.8 mm	950.4 mm	1,492 mm
La Ferme	780.5 mm	1,213.4 mm	1,543 mm
Oyster Bay	789.2 mm	1,117.8 mm	1,396 mm

21.1.1. The two new pumping stations at Mourouque and Rivière Coco have re-established the piped water supply to Port Mathurin, Grande Montagne, La Ferme, Mont Lubin and adjoining localities.

21.1.2. Crop yields improved slightly over last year's.

21.1.3. Onion export handicapped by the previous year's seed harvest, increased from 60 to 126 tons.

CAPITAL PROJECTS

LAND DEVELOPMENT

21.2. Land terracing continued on the following sites:

Citronelle Section	: Malartic—Malabar—Mt. Goyave—Baladirou
St. Gabriel Section	: Camp de Paul—Mt. Limon
La Ferme Section	: Baie Topaze—Piment
Maréchal	: Baie du Nord—Grand Var

21.2.1. This project employed 292,684 men/days of labour this year which can be broken down as follows:

Terracing	1,505,207 ft	251,387 men/days
Main drains ...	446,300 ft	36,212 men/days
Other works (access roads, wind breaks, etc.,)		5,085 men/days
		292,684 men/days

21.2.2. The above works cover an area of approximately 500 arpents.

WATER SUPPLIES

21.2.3. Constructions of the following reservoirs were completed: Rivière Coco (140,000 gallons), Mourouque (90,000 gallons), Graviers (36,000 gallons), Petit Brûlé (125,000 gallons), Brûlé (3,000 gallons), Mt. Bob (60,000 gallons), Bay Topaz (13,000 gallons), Eau Claire (12,000 gallons) Mangues (30,000 gallons) and Batatran (12,000 gallons).

21.2.4. At Grand' Baie, the main spring supplying the village has been harnessed by means of a small concrete dam from which water will be stored by gravity into a 30,000 gallon concrete reservoir lower down. This reservoir is under construction.

21.2.5. The reservoir at Mt. Cabri (150,000 gallons) to store water from Bassin Banane springs was started and is now near completion.

PASTURE DEVELOPMENT

21.3. The stand of accacia sowed in 1975 at Plaine Corail needed some re-sowing and has progressed very satisfactorily.

21.3.1. New plantations were established as follows:

La Ferme Section	*Maréchal Section*
Pointe l'Herbe: 25 arpents	Mt. Cabri: 15 arpents
Pointe Corail: 50 arpents	G. La Fouche: 15 arpents
Bay Topaz: 10 arpents	Citron: 5 arpents
Plaine Maho: 15 arpents	Valley Allas: 10 arpents
	Papayes: 5 arpents

RE-AFFORESTATION

21.4. The Forestry Division produced and planted the following species of forest tree seedlings:

Filao	264,000 seedlings on	220 arpents
Eucalyptus	571,000 seedlings on	476 arpents
Tecoma	35,700 seedlings on	51 arpents
Mahogany	5,600 seedlings on	8 arpents
Vacoas	3,500 seedlings on	5 arpents
Vitex	1,400 seedlings on	2 arpents
Cassia Eberna ...	3,850 seedlings on	5½ arpents
Bois d'Olive ...	200 seedlings on	½ arpent
Bois Puant	200 seedlings on	½ arpent
Total		768½ arpents

21.4.1. The Agricultural Services produced and planted the following species of forest tree seedlings:

Eucalyptus	46,199 seedlings on	42 arpents
Filao	78,326 seedlings on	71 arpents
Tecoma	47,191 seedlings on	75 arpents
Tatamaca	3,720 seedlings on	9 arpents
Bois Noir	3,105 seedlings on	8 arpents
Badamier	6,158 seedlings on	27 arpents
Vitex	520 seedlings on	1 arpent
Pongamme	9,689 seedlings on	24 arpents
Vacoas	1,000 seedlings on	2½ arpents
La Fouche	1,000 seedlings on	2½ arpents
Lataniers	800 seedlings on	1½ arpents
Palmiste	9,000 seedlings on	8 arpents
Arjuna terminalia ...	4,000 seedlings on	10 arpents
Bois d'Olive ...	3,000 seedlings on	7½ arpents
Jamblon	900 seedlings on	2 arpents
Mahogany	600 seedlings on	1½ arpents
		292½ arpents

EXTENSION SERVICE

21.5. The Agricultural Services produced and offered for sale to the public 9,695 fruit seedlings of mango, papaya, coconut, grape, lime, breadfruit, guava and jack.

21.5.1. With the view of establishing a sericultural industry in the island, mulberry cuttings were issued free to Agricultural Youth Clubs. One arpent of cuttings have been planted at Maréchal and St. Gabriel Livestock Breeding Stations.

21.5.2. Activities of the Agricultural Youth Clubs and Young Farmers were still restricted by the drought, but to a lesser extent than last year.

21.5.3. Spraying of pesticides was carried out free on farmers' crops.

PRODUCTION AND MARKETING

21.6. The following were exported to Mauritius:

Cattle	*Pigs*	*Sheep*	*Goats*
421 heads	1,648 heads	1,725 heads	1,893 heads

Onions	*Poultry*	*Salted Fish and Dried Octopus*
127 tons	438 crates of 48 heads	107 bales of 150 lbs

21.6.1. The approximate values of the Exports were:

421 heads of cattle at Rs 2,000/head	...	842,000
1,648 heads of pig at Rs 360/head	...	593,280
1,725 heads of sheep at Rs 200/head	...	345,000
1,893 heads of goat at Rs 200/head	...	378,600
126 tons of onions at Rs 2,350/ton	...	296,100
438 crates of poultry at Rs 600/crate	...	262,800
107 bales of salted fish/dried octopus at Rs 450/bale	...	48,150
		2,765,930

21.6.2. The export of 1,766 bales of salted fish in 1975 dropped to 107 bales in 1976. This marked drop was due to the reduction of large net permits from 28 to 8, and to the withdrawal of all the 18 gillnet permits. This was imperative for the good re-organisation of the fisheries inside the lagoons, in addition to the strict surveillance exercised over poachers. 33 of the professional fishermen rendered jobless by the above measure were employed as fisheries watchmen to reduce fraud to the strict minimum. In fact, a satisfactory result has been obtained.

ANIMAL STATISTICS

21.7. Balances at 31st December 1976.

21.7.1. *Cattle*

Station	*Adults*		*Young*		*Total*
	M	*F*	*M*	*F*	
Bay Topaz ...	7	14	8	23	52
Maréchal	2	12	2	16	32
St. Gabriel ...	1	6	—	7	14
Oyster Bay ...	2	11	7	7	27
	12	43	17	53	125

21.7.2. There were 69 calvings producing 29 male and 40 female calves

21.7.3. A severe culling among the herd had been carried out in order to keep the herd size commensurate with availability of pasture. 74 adults were sold by auction and 39 calves to farmers according to waiting lists.

21.7.4. The death percentage among calves was 24.6%. 5 adult males and 3 adult females died of old age.

21.7.5. *Pigs*

Station	Adults		Young		Totals
	M	F	M	F	
Bay Topaz ...	1	5	17	16	39
Maréchal	2	5	7	4	18
St. Gabriel ...	5	16	30	46	97
	8	26	54	66	144

21.7.6. There were 39 farrowings producing 248 piglets or 6.4 per litter, with 89.5% survival to weaning age. 111 piglets were sold to farmers for fattening and as breeding stock. 2 old unserviceable boars and 17 old unproductive sows were sold by auction.

21.7.7. *Sheep*

Station	Adults		Young		Totals
	M	F	M	F	
Crab Island ...	5	82	26	47	160

21.7.8. 59 lambs were born. 65 reams and 14 ewes were sold to farmers as breeding stock. 1 adult female and 15 lambs died.

21.7.9. *Goats*

Station	Adults		Young		Totals
	M	F	M	F	
	1	7	6	14	28

21.7.10. There were 11 births producing 15 kids. 13 young and 9 adults were sold to farmers. 5 young and 3 adults died.

21.7.11. *Rabbits*

Station	Adult		Young		Totals
	M	F	M	F	
Maréchal	4	15	9	10	58
Unsexed (20)					

21.7.12. There were 15 births producing 97 young. Deaths among the young were 19. 41 males and 39 females were sold to farmers as breeding stock.

APPENDIX I

Staff — (as at 31st December, 1976)

Appointment	*Name*	*Remarks*
Permanent Secretary ...	L. Purmessur, B.Sc. Econ. (London)	
Principal Assistant Secretary	R. M. Hurdowar, B.A. (Hons) (East Africa) D.P.A.M. (Maur.)	
Chief Agricultural Officer	B. D. N. Roy, B.Sc. (Wales) Dip. Agri. (Maur.)	
Veterinary Adviser ...	—	Vacant
Principal Agricultural Officer (3)	K. Lutchmeenaraidoo, B.Sc. Agri. (Reading), Dip. Agri (Maur.)	
	R. J. S. Moutia, D. Phil. (Gauhati) B.Sc. Hort. (London), Dip. Agr. Econ. (Oxon.) Dip. Agr. (Maur.), C.G.L.I. (Sugar Manufacture) 1st Class Cert.	On leave
	T. M. Narain, B.Sc. Agri. ,M.Sc Agr. Ext. (Reading) Dip. Agr. (Maur.).	
Temporary Principal Agricultural Officer	L. R. Brunet, B.Sc. Agr. (Reading) Dip. Agr. Ext. (Queensland), Dip. Agri. (Maur.)	
	ADMINISTRATIVE AND FINANCE DIVISIONS	
Administrative Officer (3)	A. I. Oozeerally, D.P.A.M. (Maur.)	
	J. Raghoobur	
	Subhas Chandra Mohit, B.A. (Delhi)	
Principal Finance Officer ...	D. Ramyead	
Senior Executive Officer ...	—	Vacant
In addition there were :	6 Higher Executive Officers	
	18 Executive Officers	
	2 Higher Clerical Officers	
	44 Clerical Officers	
	184 Clerical Assistants	
	1 Senior Stores Officer	Paid from the vote of the Ministry of Finance
	3 Assistant Stores Officers	
	3 Senior Confidential Assistants	
	2 Confidential Assistants	
	21 Typists	
	2 Head Office Attendants	
	57 Office Attendants	

APPENDIX I — *continued*

ESTABLISHMENT DIVISION

Appointment	*Name*	*Remarks*
Principal Establishment Officer	B.P. Sawmy	
Senior Establishment Officer	L. Gopaul	
Establishment Officer ...	Mrs. R. Mardamootoo	

AGRICULTURAL DIVISION

Divisional Scientific Officer (Agronomy)	A. L. Owadally, Ph. D. Agr. (Nottingham), B.Sc. (Hons) Agr. Bot. (Wales), Dip. Agr. (Maur.)	
Scientific Officer (Agronomy)	J. R. N. Govinden, B.Sc. (Hons) Agr. (Ibadan)	On leave
	S. N. Naidu, B.Sc. (Hons) Agr. (Maur.) M.Sc. (Biometry), (Reading) Dip. Agr. (Maur.)	
	P. P. Vyapoory, B.Sc. (Hons) Agr. Dip. Agr. (Maur.)	On leave
	H. Rojoa, B.Sc. (Hons) Agr. (Punjab)	
	C. G. Pallany, B. Sc. (Hon) Agr. (Maur.)	
	O. Bissonauth, BSc.. (Hons) Agr. (Maur.)	
	L. C. K. Li Kwan Pun, B.Sc. (Hons) Agr. (Maur.) Dip. Agr. (Maur.)	
	J. M. Heerasing, B.Sc. (Hons) Agr. (Maur.)	
	M. Y. Boodoo, (Temp) B.Sc. (Hons) Agr. (Maur.)	
Scientific Officer (Horticulture)	I. Rajkomar ,B.Sc. (Hons) Agr. (Udaipur)	On leave
	M. Ramtohul, B.Sc. (Hons) Agr. & A.H. (Uttar Pradesh)	On leave
	K. F. Lan Chow Wing, B.Sc. (Hons) Agr. (Maur.) Dip. Agr. (Maur.)	
	S. Seeruttun, (Temp.) B.Sc. (Hons) Agr. (Maur.) Dip. Agr. (Maur.)	
	V. Veerappa (Temp.) B.Sc. (Hons) Agr. (Maur.) Dip. Agr. (Maur.)	

APPENDIX I — *continued*

CANE PLANTERS' & MILLERS' ARBITRATION & CONTROL BOARD

Appointment	*Name*	*Remarks*
General Manager ...	A. A. Aumeerally, C.G.L.I. (Sugar Manufacture), B.Sc. Sugar Eng., B.Sc. Chem. Eng. (L.S.U.) Dip. Agr. (Maur.)	
Sugar Technologist ...	I. D. Nawoor, B.Sc. General, B.Sc. (Hons) Chem. (Wales)	
Accountant ...	– ...	Vacant
Senior Area Superintendent	P. R. Thelemaque, Dip. Agr. (Maur.)	
Assistant Sugar Technologist	A. A. Tin Loi, B.Sc. (Hons) Sugar Tech. (Maur.), Dip. (Hons) Agr. (Maur.)	
	K. Deepchand, B.Sc. (Hons) Sugar Tech. (Maur.)	
Area Superintendent ...	I. Aumeerally, Dip. Agr. (Maur.) C.G.L.I. (Sugar Manufacture)	
		2 vacancies
Finance Officer ...	S. Jogee	
In Addition there were:—		
	7 Senior Technical Officers (Sugar)	5 vacancies
	14 Technical Officers (Sugar)	5 vacancies
	27 Senior Technical Assistants	1 vacancy
	42 Technical Assistants	4 vacancies
	2 Laboratory Attendants	
	Punch Room Supervisor	Vacant
	Punch Verifier Operator	Vacant
	1 Telephone Attendant	
	2 Executive Officers	
	Confidential Assistant	Vacant
	8 Clerical Officers	5 vacancies
	1 Shorthand Writer — Senior Confidential Assistant	

PLANT PATHOLOGY DIVISION

Divisional Scientific Officer (Plant Pathology)	G. M. Lallmahomed, Post Grad. Cert. Nematology (Wageningen) B.Sc. (Hons) Agr. Biol. (Ibadan), Dip. Agr. (Maur.)

APPENDIX I — *continued*

Appointment	*Name*	*Remarks*
Scientific Officer (Plant Pathology)	J. Bucha, M.Sc. (Auckland), B.Sc. (Auckland)	On leave
	M. Pillay, B.Sc. (Hons) Bot. (Delhi) Post Grad. Cert. Plant Protection (Wageningen)	
	M. I. Dossa, B.Sc. (Hons) Microbiol. M.Sc. Agr. Microbiol. (Karachi)	
Senior Technical Officer (Scientific)	S. Fakim, Dip. Agr. (Maur.) C.G.L.I. (Sugar Manufacture)	
	F. B. Y. Gerval, Dip. Agr. (Maur.)	
	M. A. Peeroo, Dip. Agr. (Maur)	
	S. S. Wong Ng, Dip. Agr. (Maur.)	
	K. Li Yuen Fong, Dip. Agr. (Maur.)	
	D. Tourabally, Dip. Agr. (Maur.)	
	M. Chinappen, B.Sc. Bot. (Madras)	
	N. B. Y. Yerrigadoo, B.Sc. (Osmania)	
In addition there were:—		
	3 Technical Officers (Scientific)	
	1 Extra Technical Officer	
	9 Laboratory Attendants	

ENTOMOLOGY DIVISION

Divisional Scientific Officer (Entomology)	M. J. L. Monty, B.Sc. (Hons) Entomol. (Queensland), Dip. Agr. (Maur.)	
Scientific Officer (Entomology)	A. Joomaye, B.Sc. (Hons) Zool. & Bot. (East Africa), M.Sc. (I.A.R.I.)	
	M. Ramsamy, B.Sc. (London) M. Phil. Zool. (London)	
	Miss S. I. Balluck, B.Sc. Zool. M.Sc. Zool. (Delhi)	
Senior Technical Officer ...	Mrs. M. Li Ting Wai, Dip. Agr. (Maur.)	
In addition there were:—		
	3 Technical Officers (Scientific)	
	2 Extra Technical Officers	
	1 Field Assistant	
	4 Agricultural Trainees	
	8 Laboratory Attendants	

APPENDIX I — *continued*

AGRICULTURAL CHEMISTRY DIVISION

Appointment	*Name*	*Remarks*
Divisional Scientific Officer (Agricultural Chemistry)	—	Vacant
Scientific Officer (Agricultural Chemistry)	L. C. Lam Thuon Mine, B.Sc. Chem. (London)	Officer in charge
	N. N. Ramanjooloo, B.Sc. (Hons) Chem. (Delhi)	
	A. H. Mohungoo, B.Sc. (Hons) Chem. (Aligarh)	
In addition there were:—		
	3 Technical Officers (Scientific)	
	1 Extra Technical Officer	
	5 Laboratory Attendants	

ANIMAL PRODUCTION DIVISION

Divisional Scientific Officer (Animal Husbandry)	J. A. C. Delaitre, B.Sc. Agr. (New Zealand)	
Scientific Officer (Animal Husbandry)	B. Hulman, B.Sc. Agr. (Allahabad)	
	G. Naidoo, B.V.Sc. & A. H. (Hissar)	
	L. K. Ma Poon, B.Sc. (Hons) Agr. (Ife) Dip. Agr. (Maur.)	
	A. A. Boodoo, B.Sc. Agr. (Addis Abeba)	
In addition there were:—		
	1 Technical Officer (Agriculture)	
	1 Technical Officer (Livestock)	

ANIMAL HEALTH DIVISION

Principal Veterinary Officer	M. F. Mosaheb, B.V.Sc.; B.Sc. and A.H. (Punjab) M.Sc. Tropical Veterinary Science (N. Queensland)	
Veterinary Officer ...	R. C. S. Fokeer, B.V.Sc. & A.H. (Bombay)	On leave
	L. L. Beeharry, B.V.Sc. & A.H. (Uttar Pradesh)	On leave
	D. Sibartie, B.V.M. (Nairobi)	
	J. Maudarbaccus, B.V.Sc. & A.H. (Bombay)	
	R. Deenoo, B.V.Sc. & A.H. (Bombay)	
	H. Jhoree, M.Sc. (Kiev)	
	I. L. Prayag (Temp.) B.V.M. (Kampala)	
	V. S. Jugessur (Temp.) B.V.Sc. and A.H. (Haryana)	

APPENDIX I — *continued*

Appointment	*Name*	*Remarks*
Laboratory Technologist ...	L. H. R. Maurice, Dip. Agr. (Maur.)	
do ...	—	1 vacancy
Senior Technical Officer (Livestock)	C. A. Adelson	
	M. Bhunnoo, Dip. Agr. (Maur.)	
Senior Technical Officer (Agriculture)	M. Govendasamy, Dip. Agr. (Maur.)	On leave
Acting Senior Technical Officer	M. A. Bhunnoo, Dip. Agr. (Maur.)	
	D. Ramessur, Dip. Agr. (Maur.)	
In addition there were:—		
	6 Technical Officers (Livestock)	
	3 Technical Officers (Scientific)	
	12 Senior Technical Assistants (Livestock)	
	19 Technical Assistants (Livestock)	
	3 Agricultural Assistants	
	6 Laboratory Attendants	
DAIRY CHEMISTRY DIVISION		
Divisional Scientific Officer (Dairy)		Vacant
Scientific Officer (Dairy Chemistry) ...	P. Mardamootoo, B,Sc. (Hons) Chem. (Delhi), M.Sc.Chem. (Delhi)	On leave
	J. F. S. Hg Man Sun, B.Sc. (Hons) Chem. (Manchester)	Officer in charge Dairy
In addition there were:—		
	3 Technical Officers (Scientific)	
	3 Laboratory Attendants	
EXPERIMENTAL STATIONS		
Agricultural Superintendent	S. Y. E. Doomun	
Senior Technical Officer (Agriculture)	A. A. M. Osman, Dip. Agr. (Maur.)	
	Mrs A. C. Chan Hing Chong, Dip. Agr. (Maur.)	
	A. C. Gouges, Dip. Agr. (Maur.)	
	Y. L. Kong Ting Lun, Dip. Agr. (Maur.)	
	L. C. M. Li Ting Wai, Dip. Agr. (Maur.)	
	F. S . Lam Kee, Dip. Agr. (Maur.)	
	Mrs F. Lallmahomed-Ciechanowski, M.Sc. Agr. Econ. (Warsaw)	

APPENDIX I — *continued*

Appointment	*Name*	*Remarks*
Acting Senior Technical Officer	J. Dindoyal, B.Sc. Agr. (Poona)	
	D. Gya, B.Sc. (Hons) Agr. (Poona)	
In addition there were:—		
	8 Technical Officers (Agriculture)	
	7 Senior Technical Assistants	
	3 Field Assistants	
	15 Technical Assistants (Agriculture)	
	6 Agricultural Assistants	
	LIVESTOCK BREEDING STATION	
Agricultural Superintendent	Y. Aumjaud, Dip. Agr. (Maur.)	
Senior Technical Officer (Agricultuture)	A. Pooloo, Dip. Agr. (Maur.)	
	S. M. Sheik Hussen, M.Sc. Agr. (Kiev)	
Acting Senior Technical Officer	A. Gumani, B.Sc. Agr. (Agra)	
	T. K. Ah-Keng, Dip. Agr. (Maur.)	
In addition there were:—		
	2 Technical Officers (Agriculture)	
	1 Technical Officer (Livestock)	
	2 Field Assistants	
	3 Senior Technical Assistants	
	2 Technical Assistants (Agriculture)	
	4 Technical Assistants (Livestock)	
	5 Agricultural Assistants	
	ENGINEERING DIVISION	
Principal Agricultural Engineer	A. R. Satar, B.Sc. Agr. Eng. (Israel), M. I. Agr. E., Dip. Agr. (Maur.)	
Senior Agricultural Engineer/Agricultural Engineer	G. M. Oodally, B.Sc. (Hons) Agr. (Mc-Gill), M.Sc. Agr. Eng, (Reading, Cert. Field Mech., Mem. A.S.A.E., T. Eng. (CEI), M.I. Agr. E., Dip. Agr. (Maur.)	
	N. Toolsee, B.E. Agr. (Udaipur)	
	S. Purmanand, B.E. Agr. (Udaipur)	
Assistant Agricultural Engineer	M. Morad, Dip. Agr. (Maur.)	

APPENDIX I — *continued*

FIELD SERVICES DIVISION

Appointment	*Name*	*Remarks*
Senior Agricultural Superintendent	M. I. Fakim, Dip. Agr. (Maur.)	
Agricultural Superintendent	M. Sooltangos, Dip. Agr. (Maur.)	
Senior Technical Officer	S. Panyandee, M.Sc. Agr. (Bucarest)	
In addition there were:—		
	1 Senior Technical Assistant	
	5 Technical Assistants	
	2 Agricultural Assistants	

EXTENSION SERVICES DIVISION

Acting Divisional Scientific Officer (Agricultuture)	S. P. Mauree, B.Sc. Agr. (Madras)	
Scientific Officer (Agronomy)	K. Ramdoyal, B.Sc. (Hons) Agr. (Maur.) Dip. Agr. (Maur.)	
Agricultural Superintendent	S. P. Vythilingum, Dip. Agr. (Maur.)	
	J. J. A. Ferriere	
Senior Technical Officer (Agriculture)	I. Sassa, Dip. Agr. (Maur.)	
	M. F. Jeerooburkhan, Dip. Agr. (Maur.)	On leave
	M. John Chuan, Dip. Agr. (Maur.)	On leave
	M. Goolamhossen, Dip. Agr. (Maur.)	On leave
	J. C. Appapoulay, Dip. Agr. (Maur.)	
	N. Teeluck, Dip. Agr. (Maur.)	
	R. Gohabar, B.Sc. Agr.(Sind.)	
	Lee Kien Vong, Dip. Agr. (Maur.)	
In addition there were:—		
	25 Technical Officers	
	8 Field Assistants	
	39 Agricultural Trainees	
	1 Agricultural Assistant	
	1 Publicity Assistant	

APPENDIX I — *continued*

PROJECTS IMPLEMENTATION DIVISION

Appointment	*Name*	*Remarks*
Divisional Scientific Officer (Agriculture)	K. Ramdaursingh, B.Sc. (Hons) Agr. & A.H. (U.P. Ag) Dip. Agr. (Maur.)	
Scientific Officer (Agronomy)	M. V. D. Domun, B.Sc. (Hons) Agr. (Maur.)	
Agricultural Superintendent	B. Nundloll	
In addition there were:—		
	1 Technical Officer (Agriculture)	
	1 Senior Surveyor	
	1 Surveyor	
	1 Surveyor Assistant	
	2 Junior Druaghtsman	
	1 Printing Machine Operator	
	1 Field Assistant	

LAND USE DIVISION

Divisional Scientific Officer (Agriculture)	P. Oogarah, B.Sc. Agr. (Massey New Zealand), Postgrad. Dip. Agr. Eng. (U.K.) M.I. Agr. E., Postgrad. Cert. Course in land Resources Planning (U.K.), Dip. Agr. (Hons) (Maur.)	
Agricultural Superintendent	C. S. Amide, Dip. Agr. (Maur.)	
In addition there were:—		
	1 Technical Officer (Agriculture)	

AGRICULTURAL SERVICES — RODRIGUES

Agricultural Superintendent		Vacant
Scientific Officer (Soil Conservation)		Vacant
Scientific Officer (Animal Husbandry)		Vacant
Senior Technical Officer	John Franklin Kwet-On, Dip. Agr. (Maur.)	
	Joseph Wilson Tolbize, Dip. Agr. (Maur.)	
In addition there were:—		
	2 Technical Officers (on tour service)	

APPENDIX II

Composition of Principal Boards and Committees

(i) BOARD OF AGRICULTURE, FISHERIES AND NATURAL RESOURCES

The Permanent Secretary, Ministry of Agriculture and Natural Resources and the Environment — Chairman
The Conservator of Forest — Vice-Chairman
The Deputy Financial Secretary

Members of the Legislative Assembly

The Honourable Abdool Monaf Fakira
The Honourable Rajcoomar Preeduty Mewasingh
The Honourable Mahess Teeluck
The Honourable Marc Fok Seung

Representatives of Millers

Mr Serge Dupont de Rivaltz de Saint Antoine
Mr Robert Antoine

(ii) CANE PLANTERS AND MILLERS ARBITRATION AND CONTROL BOARD

Mr L. E. Venchard, Q.C. — Chairman
The Permanent Secretary, Ministry of Agriculture and Natural Resources and the Environment — Representative of the Minister of Agriculture and Natural Resources and the Environment
Mr Currim Currimjee — Independent Member
Mr Serge Staub, Mr Theo Maigrot — Representatives of Millers
Mr B. Ramphul ... Representative of planters cultivating cane on 30 arpents or more of land
Mr L. M. Mungur ... Representative of planters cultivating cane on less 30 arpents of land
Mr R. Seeruttun ... Representative of planters who are members of credit cooperative societies

(iii) TOBACCO BOARD

A Principal Agricultural Officer — Chairman
The Commissioner of Excise — Vice-Chairman
The General Manager, Tobacco Board
The General Manager, British American Tobacco Company (Mauritius) Limited or his representative
The Managing Director, Amalgamated Tobacco Corporation (Mauritius) Limited or his representative
Mr Madhaw Iswarchundre C. Guness
Mr A. Georges Rey
Mr Soomaroo Butan
Mr Abeerood Purgass
Mr Oomar Maudarbaccus
Mr Ikbal Nuboo Roy
Mr Bheewah Mahadoo
Mr Deoparsad Gungadeen

APPENDIX II — *continued*

(iv) THE LAND SETTLEMENT COMMITTEE

The Divisional Scientific Officer (Land Use) — Chairman

The Divisional Scientific Officer (Extension)

A representative of the Ministry of Housing, Lands and Town and Country Planning

A representative of the Ministry of Cooperatives and Cooperative Development

A representative of the Mauritius Cooperative Agricultural Federation Limited

Honourable M. Teeluck, M.L.A.

Honourable P. Mewasingh, M.L.A.

Mr Allan Gambier

The Agricultural Superintendent (Land Use)

(v) TEA BOARD

Ex-officio Members

The Permanent Secretary, Ministry of Agiculture and Natural Resources and The Environment or his representative — Chairman

The Financial Secretary or his representative

The Registrar of Cooperative Societies

The General Manager of the Tea Development Authority

Members appointed by the Minister

Mr A. R. L. Hardy	...	Representative of the Chamber of Agriculture
Mr A. Ramdin Mr L. P. de Maroussem	}	Representative of Manufacturers
Mr Indurdeosing Jaypalsing	...	Representative of Metayers
Mr H. Bissessur	...	Representative of Planters
Mr H. R. K. Aubdool Mr D. Gungadeen	}	Two other persons

(vi) SUGAR MILLERS DEVELOPMENT FUND COMMITTEE

The Permanent Secretary, Ministry of Agriculture and Natural Resources and The Environment, representative of the Minister of Agriculture and Natural Resources and The Environment — Chairman

Mr Dipnarain Manna, Administrative Officer, representative of the Minister of Finance

Mr A. Pierre Dalais Mr Pierre Dinan Mr Cyril Lagesse Mr J. L. Edouard Rouillard Mr E. P. G. White	Representatives of Millers

APPENDIX II — *continued*

(vii) SUGAR PLANTERS DEVELOPMENT FUND COMMITTEE

The Permanent Secretary, Ministry of Agriculture and Natural Resources and The Environment, representative of the Minister of Agriculture and Natural Resources and the Environment — Chairman

Mr Dipnarain Manna, Administrative Officer, representative of the Minister of Finance

Mr Chiranjive Moti, Registrar of Cooperative Societies, representative of the Minister of Cooperatives and Cooperative Development

Mr Ranjaye Kisnah, Economist, representative of the Minister of Economic Planning and Development

Mr Rafick M. Osman

Mr Jugdeo Roodurmun, M.B.E.

(viii) SUGAR INDUSTRY DEVELOPMENT FUND COMMITTEE

The Permanent Secretary, Ministry of Agriculture and Natural Resources and The Environment, representative of the Minister of Agriculture and Natural Resources and The Environment — Chairman

Mr Dipnarain Manna, Administrative Officer, representative of the Minister of Finance

Mr E. P. G. White

Mr Cyril Lagesse

Mr Rafick Osman

Mr Lutchmeeparsad Deodad

Mr Ghunraz Beeharry

(ix) SUGAR PLANTERS MECHANICAL POOL CORPORATION BOARD

Mr Keshawa Lutchmeenaraidoo, Principal Agricultural Officer representative of the Ministry of Agriculture and Natural Resources and the Environment

Mr Dipnarain Manna, Administrative Officer, representative of the Ministry of Finance

} Representatives of Government

A representative of the Sugar Planters Development Fund

Mr Rafick M. Osman

Mr Ramkurrunsingh Balgobin

Mr Nundlall Basant Rai

Mr Coonjbeeharry Dwarkasingh

} Representative of the Sugar Industry

(x) TEA DEVELOPMENT AUTHORITY

Mr R. Jeewoolall — Chairman

The Permanent Secretary, Ministry of Agriculture and Natural Resources and The Environment — Vice-Chairman

A Principal Agricultural Officer, representative the Ministry of Agriculture and Natural Resources and The Environment

APPENDIX II — *continued*

The Registrar of Cooperative Societies

The Chairman, Tea Board

Mr S. Lalloo, representing the Ministry of Finance

Mr L. Ramdin, M.B.E., representing the Chamber of Agriculture

Mr D. Gungah, representing the Federation of Credit and Tea Marketing Cooperative Societies

Mr E. P. G. White, representing the Tea Manufacture (Sugar Millers) Limited

(xi) AGRICULTURAL MARKETING BOARD

Mr T. Callychurn — Chairman

Mr G. Kooraram — Vice-Chairman

Official Members

The Chief Agricultural Officer, representing the Ministry of Agriculture and Natural Resources and The Environment

A Principal Finance Officer, representing the Ministry of Finance

Mr N. Bundhun, Administrative Officer, representing the Ministry of Commerce and Industry

The Registrar of Cooperative Societies or his representative

Unofficial Members

Mr S. J. S. Fareed

Mr P. Mauremootoo

Mr M. K. Ng Wong Hing

Mr O. V. Vythilingum

Mr L. Ramdin, M.B.E.

Mr E. Appanah

APPENDIX III

Legislation

Acts

No. 6 of 1976	...	The Sugar Industry Development Funds (Amendment) Act 1976.
No. 12 of 1976	...	The Plants Act 1976.
No. 16 of 1976	...	The Sugar Insurance Fund (Amendment) Act 1976.
No. 26 of 1976	...	The Cane Planters and Millers Arbitration and Control Board (Amendment) Act 1976.
No. 46 of 1976	...	The Sugar Industry Labour Welfare Fund (Amendment) Act of 1976.
No. 51 of 1976	...	The Rose Belle Sugar Estate Board (Amendment) Act 1976.

Government Notices

No. 10 of 1976	...	The Mauritius Sugar Industry Research Institute (Rates of Cess) (Amendment) Order of 1976.
No. 65 of 1976	...	The Botanical Gardens (Pamplemousses) (Amendment) Regulations 1976.
No. 94 of 1976	...	The Mauritius Sugar Industry Research Institute (Rates of Cess) (Amendment No. 2) Order 1976.
No. 101 of 1976	...	The Plants (Importation and Exportation) Regulations 1976.
No. 134 of 1976	...	The Mauritius Agricultural Marketing (Cess) (Amendment No. 2) Regulations 1976.
No. 135 of 1976	...	The Tea Industry Control (Amendment) Regulations 1976.
No. 162 of 1976	...	The Tobacco and Vegetables Cultivation Remuneration Order 1976.
No. 184 of 1976	...	The Registered Dogs (Issue of Discs) Order 1976.
No. 221 of 1976	...	Notice under Section 47 of the Sugar Insurance Fund Act 1974.

APPENDIX IV

List of Publications and Contributions to Literature by Officers of the Agricultural Services during 1976

Name of author	*Title of paper*	*Name Vol. No. Page Nos. of Periodical in which published*
G. M. Lallmahomed;	Strains of *Pseudomonas solanacearum* and current research on bacterial wilt in Mauritius	Page 104, Abstract in Proc. 1st Int. planning conf. & Workshop on the ecology and control of bacterial wilt. North Carolina USA. 166 pp.
J. A. Claude Delaitre;	Progress achieved in Animal production in Mauritius and plans for the future	Revue Agricole et Sucrière de l'Ile Maurice. Vol. 55 Nos. 1 & 2 pp 307–314.
S. E. Kunz and J. Monty;	Biology and ecology of *Stomoxys nigra* Macquart and *Stomoxys calcitrans* (L) (Diptera, Musidae) in Mauritius	Bulletin of Entomological Research Vol. 66 No. 4 pp 745–755.
M. Ramtohul and A. L. Owadally;	Selection of vegetable varieties	Revue Agricole et Sucrière de l'Ile Maurice, Vol. 55 No. 4. pp 369–383.

APPENDIX V

Conversion Table

1 arpent	1.043 acres
1 gaulette	10.61 feet
1 metric ton	1,000 kilos
1 long ton	1,016 kilos
1 pound avoirdupois	454 grams
1 kilo	1,000 grams
1 hundredweight	50.803 kilos
1 cord	92.82 cubic feet
1 imperial gallon	4.45 litres
1 rupee	8.9 pence

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